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MINUTES

OF THE

BOARD OF COMMISSIONERS OF ELECTRICAL SUBWAYS IN
THE CITY OF NEW YORK.

Minutes of a meeting of the Board of Commissioners of Electrical Subways held in Parlor No. 101, Metropolitan Hotel, on Monday, July 20, 1885, at twelve o'clock noon. Present, Charles E. Loew, Jacob Hess and Theo. Moss. Mr. Hess elected temporary chairman. On motion of Mr. Moss, Mr. Loew was nominated as President of the Board and duly elected. Mr. Loew having taken the chair, Mr. Hess nominated Mr. Moss as Secretary, and he was duly elected. On motion of Mr. Moss, F. A. Lovecraft was duly appointed Assistant Secretary.

The following preamble and resolutions were offered by Commissioner Loew and adopted unanimously:

Whereas, this Board has now organized as required by law, and whereas by Chapter 499 of the Laws of 1885, it is made the duty of this Board to cause to be removed from the surface and put, maintained and operated under grounds wherever it may deem it practicable, all telegraph, telephonic, electric or other wires and cables, or electrical conductors, including what is known as telegraph poles and other appurtenances thereto, used and operated or intended to be used and operated by any company or person in the City of New York, and whereas it is made obligatory by said act, when it is desired or required that such electrical conductors be placed under ground in any of the streets, avenues or other highways of said city, be filed with this Board a map or maps made to scale, showing the streets, avenues or other highways desired to be used for such purposes, and giving the general location, dimensions and cost of the underground conduits desired to be constructed, and whereas if no suitable plan is prepared or in use within sixty days after June 13, 1885, it shall be the duty of this Board to cause to be devised and made ready for use such a general plan as will meet the requirements of said act and of Chapter 534 of the Laws of 1884.

Therefore, Resolved, That it is the purpose of this Board to place and cause to be maintained, underground, all electrical conductors operated, or to be operated, in the City of New York, wherever practicable, and at the time and in the manner required by said Acts.

Resolved, That all persons, companies and bodies using or operating electrical conductors in the City of New York and coming within the purview of said acts be forthwith notified by the Secretary of this Board, that this Board has been properly organized, as provided by said act of 1885, and has assumed the duties imposed upon it and is proceeding to discharge the same according to law. And that this Board will forthwith, at the Metropolitan Hotel, in the City of New York, receive and thereupon duly consider any plan or plans, map or maps, method or methods, proposed for its consideration or approval in connection with, and pursuant to, the requirements of said Chapter 534 of the Laws of 1884, and Chapter 499 of the Laws of 1885, and that this Board requests that said plans, maps and methods be submitted for its consideration as soon as practicable, before the expiration of said sixty (60) days, in order that the proceedings of this Board in connection therewith, and in the general discharge of its functions, may be duly expedited and the intent and purpose of said acts carried into effect as soon as properly possible.

The following resolution, offered by Commissioner Moss, was unanimously adopted.

Resolved, That the following notice be published in the newspapers and a copy thereof be sent to all persons, companies and corporations owning, leasing, using or controlling electric wires and poles.

In pursuance of Section 4 of Chapter 499 of the Laws of 1885, passed June 15, 1885, entitled an act providing for placing electrical subways underground in the cities of this State, and for commissioners of electrical subways; all corporations, associations and persons owning, leasing, using or controlling telegraph, or electric wires or other wires, cables and telegraph poles, are hereby requested to submit on or before the 14th day of August, 1885, to the Board of Commissioners of Electrical Subways, in the City of New York, at the above address, any and all methods proposed by them for electrical lighting or electrical communication by conductors that shall be constructed underground.

The following two resolutions were offered by Commissioner Hess and adopted unanimously:

Resolved, That the owners, lessees, or occupants of houses be requested to refuse permission for telegraph, telephonic or electrical wires over or on their respective buildings, without first securing a permit from this Board.

Resolved, That all corporations, associations and persons owning, leasing, using or controlling telegraph, telephonic, electric or other wires, cables and telegraph poles

be requested to report to this Board at its next meeting any plans for the construction and placing of new wires overground, notice to be sent by the Secretary.

Motion by Commissioner Hess, that the Secretary be authorized to prepare rules for the government of this Board, and present same for adoption at its next meeting.

Adopted.

On motion of Commissioner Moss this meeting adjourned to Monday next, July 27th, at twelve o'clock noon, at Parlor No. 101, Metropolitan Hotel.

Minutes of a meeting of the Board of Commissioners of Electrical Subways held in Parlor No. 101, Metropolitan Hotel, on Monday, July 27, 1885, at twelve o'clock noon. Present: Commissioners Charles E. Loew, Jacob Hess and Theodore Moss.

Minutes of the last meeting were read and approved. Communications from the Board of Police Commissioners of the City of New York, George B. Pennock, Room No. 12, World Building, were read and ordered to be placed on file.

Letters from E. C. Townsend, No. 84 Nassau street; Matthew H. Devey, Thurlow, Delaware County, Pa.; Stephen M. Chester, No. 26 Church street; A. A. Knudson, No. 39 Nassau street.

The Brooks Underground Conduit Company, No. 310 Chestnut street, Philadelphia, were read, and the following answer was directed to be sent to each:

DEAR SIR—In reply to your letter of, I am directed to say that under the laws governing this Commission, it will not be prepared to receive propositions such as stated in your letter until August 14.

After that time your communication will receive due consideration:

Respectfully, for the Commissioners,

THEODORE MOSS, Secretary.

On motion of Commissioner Moss, meeting adjourned to Monday next, August 3d, at twelve o'clock noon, Parlor No. 101, Metropolitan Hotel.

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Minutes of a meeting of the Board of Commissioners of Electrical Subways, held in Parlor No. 101, Metropolitan Hotel, on Monday, August 3, 1885, at twelve o'clock noon. Present: Commissioners Charles E. Loew, Jacob Hess and Theodore Moss.

Minutes of the last meeting were read and approved.

Communications from E. C. Townsend, No. 84 Nassau street, N. Y. City; S. G. Lynch, No. 144 La Salle street, Chicago, Ill.; Theo. A. B. Putnam, No. 40 Broadway, N. Y. City; Accessible Underground Conduit Co., No. 36 So. Fourth street, Philadelphia, Pa.; Universal Electric Co., Paterson, N. J.; Callender Insulating Co., No. 35 Wall street, N. Y. City., were read, and the following reply directed to be sent to each:

NEW YORK, August 3, 1885.

DEAR SIR—In reply to your letter of, I am directed to say that under the laws governing this Commission, it will not be prepared to receive propositions such as stated in your letter until August 14.

After that time your communication will receive due consideration.

Respectfully, for the Commissioners,

THEODORE MOSS, Secretary.

Communication from Hon. Rollin M. Squire, Commissioner of Public Works, was read, and the following reply directed to be sent:

NEW YORK, August 3, 1885.

HON. ROLLIN M. SQUIRE, Commissioner of Public Works.

DEAR SIR—In reply to your communication inclosing resolution of the Common Council granting permission to Thomas F. Jennings to place certain wires underground, the Commissioners of Electrical Subways have notified Mr. Jennings to submit to them his plans or methods under which said work will be done, and respectfully request that you withhold the necessary permit until this Board has had and approved the same.

Very Respectfully,

THEODORE MOSS, Secretary.

Resolution of Common Council returned herewith.

Letter from Mr. Thomas F. Jennings, No. 327 Greenwich street, N. Y. City, was read, and the following reply directed to be sent:

NEW YORK, August 3, 1885.

THOMAS F. JENNINGS, ESQ.,

DEAR SIR—In reply to your letter of August 2, 1885, the Commissioners direct me to notify you that until they have received your plans or methods of placing the wires

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underground between the points stated in your letter, and approved of same, cannot grant the permission asked for.

Very Respectfully,

THEODORE MOSS, Secretary.

Letter from the Commercial Cable Co. was read, and the following reply directed to be sent:

NEW YORK, August 3, 1885.

GEO. G. WARD, General Manager, Commercial Cable Co., No. 21 Wall street, N. Y. City.

DEAR SIR—In reply to your letter of July 27, the Commissioners respectfully request that you will send, for their inspection, plans used in placing and working your wires underground, and also furnish the routes through which they are carried within the corporate limits of the City of New York.

Very Respectfully,

THEODORE MOSS, Secretary.

Letter from B. F. Carpenter, No. 115 Broadway, New York City, was read, and the following reply was directed to be sent:

NEW YORK, August 3, 1885.

B. F. CARPENTER, ESQ.

DEAR SIR—In reply to your letter of July 27, would say that you misunderstood the meaning of the resolutions referred to.

On and after August 14 plans for placing wires underground will receive due consideration from this Commission.

Very Respectfully,

THEODORE MOSS, Secretary.

Hon. Thomas C. Ecclesine, of No. 16 Broad street, on behalf of the American Sectional Electrical Underground Company, requested to be informed at what time he could be heard by the Commissioners, and the Secretary was instructed to notify him of the time to be fixed.

Mr. O'Brien, of No. 7 Nassau street, for the Stock Quotation and Telegraph Company, asked permission to continue their unfinished work until the Commission adopts some general plan of placing wires underground. He was directed to present plans and routes of proposed work, and to put his request in writing.

Mr. Holmes, President of the Holmes Electric Protective Company, No. 518 Broadway, was heard as to the impracticability of putting the wires of his company underground, and requested the Commissioners to call at the company's office where he could show the working of his system and better illustrate his argument.

Meeting adjourned to Monday next, August 10, at 12 o'clock noon, Parlor No. 101, Metropolitan Hotel.

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Minutes of a meeting of the Commissioners of Electrical Subways, held in Parlor No. 101 of the Metropolitan Hotel, Monday, August 10, 1885, at twelve o'clock noon.
Present: Commissioners Loew, Hess and Moss.

Minutes of the previous meeting were read and approved.

A letter was read from E. C. Townsend and ordered on file.

A letter was read from B. Williams, and the Secretary directed to file same, after giving the desired information as follows:

NEW YORK, August 10, 1885.

B. WILLIAMS, ESQ., 171 La Salle street, Chicago, Ill.

DEAR SIR—In reply to your letter of August 3 would say, under the law governing this Commission, no steps can be taken until the expiration of the sixty days' time given to all companies and individuals owning or leasing wires, to submit their plans for placing same underground. This notice expires August 13, after which date the Commissioners will receive plans and methods from any one, and after due consideration of all, decide on some general plan for placing the wires underground.

Very Respectfully,

THEODORE MOSS, Secretary.

A letter from Thomas F. Jennings, No. 327 Greenwich street, N. Y. City, was read, and the Secretary directed to obtain from Mr. Jennings map and plan of route.

NEW YORK, August 10, 1885.

THOS. F. JENNINGS, ESQ., 49 Broadway.

DEAR SIR—The Commissioners request that you send drawings, to file with your last letter; also map of the route to be taken, same to give depth at which pipes are to be laid, distance from curb, etc., etc.

The Commissioners will meet again on August 13, 1885, at twelve o'clock, as above.

Very Respectfully,

THEODORE MOSS, Secretary.

Letter from the Telegraphic Time Company was read and ordered placed on file.

Letter from the Brooks Underground Conduit Company was read, and the Secretary was directed to acknowledge its receipt, thank the company for their suggestions and let them know when the Commissioners require their presence.

[August 10, 1885.]

New York, August 10, 1885.

JAMES A. PALMER, ESQ., General Manager, Brooks' Underground Circuit Company, No. 310 Chestnut street, Philadelphia, Pa.

DEAR SIR—At a meeting of the Commissioners held this day, the Secretary was directed to acknowledge the receipt of your letter, to thank you for the suggestions contained therein, and to say you will be duly notified of a time to be fixed when the Commissioners will be pleased to give you a hearing on the subject of Underground Electrical Construction.

Very respectfully,

THEODORE MOSS, Secretary.

Letter was read from the United States Illuminating Company, 59 and 61 Liberty street, N. Y. City. The Commissioners will examine into the contents of same and duly notify the company of the date of the next meeting.

New York, August 10, 1885.

EUGENE T. LYNCH, ESQ., President U. S. Illuminating Company, 59 and 61 Liberty street, N. Y. City.

DEAR SIR—Your letter of August 6 received and read before the Commissioners at their meeting this day.

They will give due consideration to the request contained therein, and beg to notify you that their next meeting will be held at Parlor No. 101, Metropolitan Hotel, on Thursday, August 13, 1885, at twelve o'clock.

Yours respectfully,

THEODORE MOSS, Secretary

A communication from the Western Union Telegraph Company was read and ordered placed on file.

A letter from the Commissioner of Public Works and the Fire Department was read. The Secretary was directed to obtain from them maps and plans of their intended operations.

New York, August 10, 1885.

J. ELLIOTT SMITH, ESQ., Superintendent Fire Alarm Telegraph Company, No. 155 Mercer street, N. Y. City.

DEAR SIR—Your letter of July 29, addressed to the Commissioner of Public Works, has been referred by him to this Commission.

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You will please send for inspection plans to be used in placing and working your wires underground, and also furnish a map showing the route through which they are to be carried.

Very respectfully,

THEODORE MOSS, Secretary.

A letter was read from Jas. G. Purdy, and ordered placed on file.

A letter was read from the Metropolitan Telephone and Telegraph Company, and laid over for future consideration of the Commissioners.

A letter was read from J. N. L. Seymour, relative to offices, and referred to Commissioner Hess with power to act.

A plan was received from Charles Schurhurst and placed on file for future consideration.

Letters and samples were received from the Universal Insulating Company, Paterson, N. J., and ordered placed on file.

Communications from the Baltimore and Ohio Telegraph Company, represented by their superintendent and electrician, who were requested to furnish to the Board the necessary plans and maps, showing where they want to place their wires.

Mr. Jaegel submitted plan for underground wires and was requested to elaborate same and present at the next meeting of the Commissioners.

Mr. Beere, of the American Underground Electric Wire Company, was heard relative to their system, and was asked to submit plans and working models.

Adjourned to Thursday, August 13, at twelve o'clock noon, Metropolitan Hotel.

[August 13, 1885.]

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held in Parlor No. 101, of the Metropolitan Hotel, Thursday, August 13, 1885, at twelve o'clock noon. Present: Commissioners Loew, Hess and Moss.

Minutes of the last meeting were read and approved. The following preamble and resolution offered by Commissioner Moss was adopted:

Whereas, it is desirable that this Commission should avail itself of the consideration of all plans or methods for constructing electrical subways, which may aid its conclusions in determining the method best calculated to carry out the act under which it was created; therefore,

Resolved, That an advertisement be inserted in one or more daily papers calling upon inventors, electricians and all persons having plans which they wish to present for the consideration of the Commission to present same on or before the 1st day of September next, briefly stating the advantages claimed for such plan or method, and also the estimated cost per mile.

The following preamble and resolution offered by President Loew was adopted:

Whereas, it is provided by Chapter 499 of the Laws of 1885, that if within sixty days after the passage thereof no suitable plan is proposed to this Board for placing, maintaining and operating underground the electrical wires, cables and other conductors in use, in the City of New York, it is the duty of this Board to cause to be devised and made ready for use such a general plan in the premises as will meet the requirements of said act and of Chapter 534 of the Laws of 1884, and, whereas said sixty days expire this day, therefore,

Resolved, That every corporation, association or person using or desiring to use any electrical conductors in the City of New York, do forthwith file with this Board such map or maps and other suitable descriptions as will fully inform this Board concerning the location, courses, termini spaces and all other details and requirements concerning the electrical conductors operated or desired to be operated by such corporation, association or person in the City of New York, to the end that this Board may be enabled to make due provision for said conductors in the general plan and subway to be devised as aforesaid, and which it has full authority to require to be used for all the electrical conductors aforesaid.

The following preamble and resolution offered by President Loew was adopted:

Resolved, That the Secretary procure from the Department of Public Works of the City of New York, and keep on the files of this Board an accurate list of all corporations, associations, companies and persons using or maintaining electrical wires or other such conductors, above or underground in said city, together with a complete

account and description of the courses, termini and all other particulars or information, touching said wires or other conductors and their appurtenances, as in use or authorized to be used in said city, which said Department may be able to give to this Board; and that said Secretary further procure from the Clerk of the Board of Aldermen and Common Council an accurate list of all corporations, associations, companies or persons authorized by said Board of Aldermen or Common Council, to place, use or maintain above or underground in said city, any electrical wires, cables or other such conductors and their appurtenances, together with a full account of the courses, termini and all other information relating to such electrical conductors under such authorization, that said Clerk may be able to afford to this Board, and that the list and other information procured from said Clerk be kept on the files of this Board.

The following resolution by President Loew was adopted:

Whereas, Section 1 of Chapter 534 of the Laws of 1884 requires that all telegraph, telephone and electric light wires and cables in the City of New York shall thereafter be placed under the surface of the streets, lanes and avenues of said city, and, whereas, by Chapter 499 of the Laws of 1885, it is made the duty of this Board to cause such wires and cables to be put, maintained and operated underground wherever practicable, and, whereas, by Section 4 of said last named act this Board, except in the case of wires operated by a department of the Government of said city, can grant an application for permission to deviate from an underground system only in one of the following cases of exception, viz.:

1. Whenever, in the suburbs or along the streets, avenues or other highways in sparsely inhabited or unoccupied portions of the city, the public interests do not require the electrical conductors to be placed underground, and,
2. Whenever in any other locality of this city it is deemed by this Board to be for any cause impracticable to construct and successfully operate electrical conductors underground; therefore,

Resolved, That this Board will not entertain any applications for permits to deviate from an underground system that are not based upon one at least of the grounds of exemption aforesaid.

Communication from the Bankers and Merchants' Telegraph Company in regard to underground wires in Chicago was ordered to be placed on file.

Communication from Col. Andrew Derrom, Paterson, N. J., offering suggestions on underground wires, was read and ordered placed on file.

Communication from Hussey Electric Light and Power Company, No. 1323 Broadway, N. Y. City, was laid over for future action of the Board.

Communication from Thos. F. Jennings, No. 49 Broadway, N. Y. City, offering diagram for underground wires, was laid over for future action of the Board.

Communication from Sidney F. Shelbourne, President New York Electric Lines Company, Nos. 37 and 39 Wall street, submitting maps, plans and diagrams, was laid over for future action of the Board.

Communication from A. McDonald, President Averell Insulating Conduit Company, was read and laid over for future action of the Board.

Communication from M. H. Devey, No. 353 Parker street, Chester, Pa., was read and laid over for future action of the Board.

Communication from G. A. Aldrich, Secretary Accessible Underground Conduit Company, Philadelphia, was read and ordered to be placed on file.

Communication from W. Grigg, No. 173 East 125th street, N. Y. City, was read and ordered to be placed on file.

Communication from Allen & Stead, No. 44 Broadway, N. Y. City, was laid over for future action of the Board.

Communication from Faraday Electric Cable Works, Cambridgeport, Mass., was read and laid over for future action of the Board.

Communication from American Underground Electric Wire Company, No. 1389 Broadway, N. Y. City, was read and ordered to be placed on file.

Mr. Jaegel appeared before the Commissioners with model for underground wire with conduit and explanations. The same was ordered to be placed on file at the office.

The following letter was sent to the Commissioner of Public Works, in accordance with the resolution of Commissioner Loew:

NEW YORK, August 13, 1885.

HON. ROLLIN M. SQUIRE, Commissioner Public Works.

DEAR SIR—By direction of the Commissioners I herewith inclose a copy of a letter received from the U. S. Illuminating Company, and also a copy of the resolution adopted by the Board this day, which is an answer to it and will be to all similar applications.

Very respectfully,

THEODORE MOSS, Secretary.

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The following is a copy of a letter sent to the Commissioners of Public Works and to the Clerk of the Board of Aldermen and Common Council, in accordance with the resolution of Commissioner Loew.

NEW YORK, August 13, 1885.

DEAR SIR—I am directed by this Commission to inclose you a copy of a resolution adopted this day, and to request that you send an answer thereto at your earliest convenience.

Very respectfully,

THEODORE MOSS, Secretary.

The following is a copy of a letter sent to the president of the U. S. Illuminating Company, in accordance with the resolution of Commissioner Loew:

NEW YORK, August 13, 1885.

EUGENE T. LYNCH, President U. S. Illuminating Company.

DEAR SIR—In reply to your letter of August 6, I am directed by the Commissioners to send you a copy of a resolution adopted at their meeting to-day.

Very Respectfully,

THEODORE MOSS, Secretary.

Adjourned until Friday, August 14, 1885, at Parlor No. 101, Metropolitan Hotel, at twelve o'clock noon.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held in Parlor No. 101, Metropolitan Hotel, Friday, August 14, 1885.

Present: Commissioners Loew and Hess.

Minutes of the last meeting were read and approved.

Communication from Geo. B. Pennock, Room No. 12, World Building, was read, and laid on file for future consideration by the Board.

Communication from J. C. Allen, Secretary Brush Illuminating Company, was read and laid on file for further consideration by the Board.

Communication from Col. Stephen M. Chester, No. 26 Church street, was read and ordered placed on file for future action of the Board.

Communication from E. C. Townsend, No. 84 Nassau street, was read and ordered placed on file.

Communication from Thos. M. Foote, president Mutual District Telegraph Company, No. 29 Murray street, was read and ordered placed on file.

Communication from A. J. Baldwin, Empire and Bay State Telegraph Company, No. 58 Broadway, was read and ordered placed on file.

Communication from Eugene T. Lynch, president U. S. Illuminating Company, was read and laid over for future action of the Board.

Hon. Thomas C. Ecclesine appeared before the Board for the American Sectional Underground Company, asking that he be notified of the time and place to submit plans and diagrams. Commissioner Hess requested the Secretary to notify Mr. Ecclesine as soon as a proper place could be secured for the display of said plans and hearing.

Communication from Francis J. Twomey, Clerk of the Board of Aldermen, together with books, was received. The Secretary of the Board was ordered to acknowledge the same with thanks.

Adjourned until Tuesday, August 18, twelve o'clock noon, at Parlor No. 101, Metropolitan Hotel.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held in Parlor No. 101, Metropolitan Hotel, Tuesday, August 18, 1885, at twelve o'clock noon. Present: Commissioners Loew, Moss and Hess.

Minutes of the last meeting were read and approved.

Communications from Francis J. Twomey, Clerk of the Board of Aldermen; Richard Rossiter, secretary Universal Insulating Company; Geo. G. Ward, general manager Commercial Cable Company; Electrical Review, No. 23 Park Row, N. Y. City, was read and ordered to be placed on file.

Communication from Gould & Co., Nos. 37 and 39 N. Second street, Philadelphia, was read and ordered to be placed on file. The Secretary was requested to advise that their plans could be submitted to the Board at any meeting.

Mr. B. F. Carpenter appeared before the Board with plans and drawings for cable conduit. He was requested to leave the same on file and that they would receive due consideration.

Communication from J. Hollins Bowly, No. 20 Jewell street, Jersey City, was read and placed on file. Secretary was requested to advise Mr. Bowly that plans may be submitted at any meeting of the Board.

Communication from Averell Insulating Conduit Company, requesting letter to the Commissioner of Public Works to be accorded information. No objections, granted and letter given to their representative, that all information possible be given relative to underground wires as now used.

Mr. E. Heyleyn appeared before the Board and submitted plans and drawings for material for carrying any kind of wire underground. Commissioner Hess requested that Mr. Heyleyn submit a model.

Mr. Jos. W. Horner appeared before the Board and submitted model and explanation. Ordered placed on file for future consideration.

The following resolution offered by Commissioner Loew was adopted:

Resolved, That permission be granted to Thos. F. Jennings to lay certain wires underground temporarily, subject to the order of the Commissioner of Public Works, from New York Produce Exchange to No. 64 New street, as per plans and specifications filed with this Commission on the condition only that he agrees to remove said work and wires on the order of this Board when any general plan shall have been adopted for placing wires underground.

Adjourned until Wednesday, August 26, 1885, at twelve o'clock noon, at Parlor No. 101, Metropolitan Hotel.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held in Parlor No. 101, Metropolitan Hotel, Wednesday, August 26, 1885, at twelve o'clock noon.

Present: Commissioners Loew, Hess and Moss.

Minutes of the last meeting were read and approved.

Communications from H. E. Dey, No. 96 and 98 Grand street, N. Y. City; Stephen M. Chester, Elizabeth, N. J.; Frederick Beilstein, Brooklyn; John H. Gould, No. 305 So. Second street, Philadelphia, Pa., were read and ordered to be placed on file.

Communication from Wm. Gosling, P. O. Box 1033, Newport, R. I., was read, and the Secretary was requested to notify him that a hearing will be granted any time within the next thirty days.

Mr. Geo. M. Mowbray, North Adams, Mass., appeared before the Board with illustrations and specimens of the Para rubber insulation, which were ordered placed on file for future consideration of the Board.

Mr. C. C. Gilman, Washington Building, N. Y. City, appeared before the Board with diagram and plans, which were left for future consideration.

Mr. Ranald McDonald appeared before the Board and read communication with model, which were ordered placed on file for future consideration of the Board.

Mr. J. J. C. Smith, No. 13 Park Row, N. Y. City, appeared before the Board and read communication, showing model. Secretary was requested to notify Mr. Smith when to appear again before the Board.

The secretary of the American Underground Electric Lines Company appeared before the Board with model and illustrations. Ordered placed on file, additional models to be laid before the Board at its next meeting.

Commissioner Hess requested the Secretary to notify Dr. Green, president W. U. Telegraph Company, that a hearing will be granted at the next meeting of the Board. The following letter was therefore sent:

NEW YORK, August 27, 1885.

NORVIN GREEN, ESQ., President W. U. Telegraph Company.

DEAR SIR—The Commissioners desire me to say that their next meeting will be held at the offices, No. 23 West 23d street, on Monday, August 31, 1885, at twelve o'clock noon, and that they will be pleased to give a hearing to the representative of your company at that time.

Very respectfully,

THEODORE MOSS, Secretary.

Commissioner Hess, appointed by the Board to secure offices, laid before it the lease of rooms at No. 23 West 23d street, which was approved and ordered signed, rooms to be ready for the next meeting.

Adjourned until Monday, August 31, twelve o'clock noon, at No. 23 West 23d street.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23d street, N. Y. City, on Monday, August 31, 1885.

Present: Commissioners Loew, Hess and Moss.

Minutes of the last meeting read and approved.

Communication read from I. F. Morrison, president of the National Electric Light Association, and ordered to be placed on file.

Communication from E. H. Austin, P. O. Box No. 2255 N. Y. City, inquiring the date for sending in plans. Secretary was instructed to place on file and notify him to send them in before the next meeting of the Board.

Communication from Thomas Wallace, No. 150 Broadway, was read and ordered to be placed on file for future consideration.

Communication from I. Hollins Bowly, No. 20 Jewett's avenue, Jersey City, read and ordered to be placed on file.

Communication from C. D. Shrieves, No. 1420 13th street, Philadelphia, was ordered to be placed on file for future consideration.

Communication from B. Cohen, No. 353 Canal street, N. Y. City, was read, and the Secretary instructed to notify him that a hearing will be given him at the next meeting.

Dr. Norvin Green, president of the Western Union Telegraph Company, attended in response to the invitation of the Board. In reply to a question from President Loew, he said that his company already has a system of underground wires in New York, operating to the Stock, Produce and Cotton Exchanges, two wires from the main office to 23d street, and the connection with the cables is also underground. The system consists in putting the wires, insulated by gutta percha, into iron tubes, and it has given great satisfaction. "We have been trying the Brooks' System, by which the wires are insulated with paraffine oil and drawn through a tube filled with it, and we find it works exceedingly well. So long as the oil is pure and is kept free from deposit,

I am sanguine it can be made to succeed. The advantage of the iron tube is that we can draw the wires in and out without digging up the streets, which can't be done by any other system."

President Loew asked if their whole system of wires could be laid through the city in these tubes?

Dr. Green answered: "We certainly could, but it is doubtful if it would pay. We intend to extend our wires from 23d street to 42d street in this way, and through the tunnel to Harlem."

Commissioner Hess inquired what size tubes were used, and Dr. Green said three inches.

Dr. Green said further that their trunk lines were along Third, Fourth, Sixth and Seventh avenues, and there were none on Broadway. The difference in the cost of laying one wire and 100 is not much, as the expense of digging and paving is the same. In round figures underground wires cost \$100 per mile, against \$23 per mile for overhead wires, and the latter will last three times as long as underground. In fact, wires are less serviceable underground than they are under water. Everything depends on the thoroughness of the insulation, and we have had a great many firms offering plans, but have never found anything to make a wire last over a year underground, except, perhaps, the Brooks system.

In reply to Commissioner Moss, Dr. Green said he did not think it would work well to have telegraph, telephone and electric light wires together, unless some perfect system of insulation could be found. They had spent a good deal of money, but had not found it. It was a positive detriment to the public service to have wires underground, as there is a retardation of the current, which makes the wires work very slowly. If we bury the wires in New York other cities will want us to do the same, and if one hundred cities or so require us to do it, it makes a great difference in the service.

Commissioner Hess pointed out that in Germany the wires were underground and no complaints were heard, to which Dr. Green replied that as the wires belonged to the Government the people had to be satisfied with the service, whether good or bad.

The London service is very fine, but they have a central wire for each office, and thus have direct communication; we have several offices on each wire, and, of course, they have to wait to get in. In London the wires are laid along the underground railroad, and there were other advantages not possessed here.

Commissioner Moss suggested that it might be feasible to run the wires along the elevated railroads, and Dr. Green said they had the right to use the Third avenue line for some distance, and have been discussing a scheme, but the engineers had not come to a decision.

President Loew asked how many wires the Western Union have overground, but

Dr. Green could not say. He would, however, send the information, and also a map showing the routes and number of wires.

George D. Sutton submitted a model of a conduit to take the place of the curbstone.

Mr. D. O. Callender, of the Callender Insulating and Waterproofing Company, East Newark, and Mills Building, No. 35 Wall street, submitted an explanation and plans of his system of insulating.

Mr. I. Hollins Bowly also offered some explanation of his system of conduits.

Mr. I. A. Stoutenberg, of No. 29 Wall street, desired to offer some explanations of his system, and the Secretary was instructed to notify him to appear at any of the Board meetings.

Communication from Mr. Benzette Williams was read and ordered to be placed on file.

Diagram and communication from Mr. Theo. R. Betzel, No. 195 Broadway, were submitted, and the Secretary was instructed to place them on file and notify Mr. Betzel that the Commissioners will hear him on Monday next.

Communication from Bentley & Knight, No. 115 Broadway, N. Y. City, read and ordered to be placed on file.

It was moved and seconded and adopted that the Board at its rising adjourn until Monday next, at 10 a. m.

The meeting then adjourned accordingly.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, N. Y. City, on Monday, September 7, 1885. Present: Commissioners Loew, Hess and Moss.

Minutes of the last meeting were read and approved.

Communication read from Hon. R. M. Squire, Commissioner of Public Works, enclosing schedule of permits for underground wires issued by the Department. Secretary was instructed to acknowledge receipt and express the thanks of the Commissioners.

Communications were read from M. J. Dewey, Bloomingdale, N. J.; W. C. Barney, No. 917 East 16th street, Washington, D. C.; E. C. Hoffman, Newark, N. J.; D. A.

Matthews, No. 47 Cedar street, N. Y. City.; Standard Underground Cable Company, Pearl street, N. Y. City, and the Secretary was instructed to place on file for future consideration, and also to notify the various parties to submit any drawings or models they had.

Mr. E. H. Bentley, of the Bentley & Knight Electric Railway Company, explained and submitted plans for two different conduits, which were filed for future consideration.

Hon. A. McDonald and General Averill explained the Averill Insulating Conduit Company's plan and submitted drawings and model.

John B. King, Brooklyn, submitted model for utilizing the sewer archways.

E. A. Algubar, Theo. B. Betzel, B. A. Dryer explained their plans and submitted drawings and models.

A. C. Jackson, First avenue, N. Y. City, also submitted plan and drawings, which were filed for future consideration.

It was moved, seconded and adopted that the Board at its rising adjourn until Wednesday, September 9, at 11 a. m.

The meeting then adjourned accordingly.

Wednesday, September 9, 1885, Commissioners Loew and Moss present.

It was agreed in the absence of Commissioner Hess to postpone the meeting until Monday, September 14, at 11 a. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Monday, September 14, 1885. Present: Commissioners Loew, Hess and Moss.

The minutes of the last meeting were read and approved.

Communications from Col. A. Derrom, The Seymour Tubular Curb Company, Ege & Dodson, Chas. A. Sewell were read and ordered to be placed on file.

The following resolution, offered by Mr. Commissioner Loew, was adopted:

Resolved, That to afford reasonable opportunities to inventors and others for the

final submission of plans for electrical subways, this Commission continue its regular meetings for that purpose till the 15th day of October, next, inclusive, and that thereafter the Commission proceed to cause to be devised the plan of electrical subways intended by the law governing this Commission.

On motion of Commissioner Moss William J. Sefton was appointed stenographer to the Board, his appointment to date from September 1.

Communication read from The Manhattan District Telegraph Company promised to submit plans and maps of wires now operated, and offering hearty co-operation. Secretary was instructed to acknowledge receipt and tender the thanks of the Commissioners.

Communication read from The Gold & Stock Telegraph Company asking permission to place a wire overhead 20 feet on West 46th street, was referred to Commissioner Hess for enquiry and report.

Communication from Mr. D. Butterfield, No. 52 East 25th street, was read, and Secretary was instructed to reply that plans would be received until October 15, next.

General Averill continued his explanation of the Averill Insulating Company's system.

Mr. J. B. Beere, of the American Underground Wire Company; Mr. W. S. Barney, of Washington; Mr. Dowse, of the N. Y. Insulating Company, explained their various systems.

It was moved, seconded and adopted that the Board at its rising adjourn until Wednesday, September 16, at 11 a. m.

Board adjourned accordingly.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, Wednesday, September 16, 1885. Present: Commissioners Loew, Hess and Moss.

Minutes of last meeting read and approved.

The following resolution, proposed by Commissioner Hess, was adopted:

Resolved, That the Commissioners of the Fire Department be respectfully requested to inform this Board if they permit any electric light companies to place wires on poles belonging to the Fire Department.

Commissioner Hess reported with regard to the Gold and Stock Telegraph Company's application, that the distance required to be covered would be greater than that mentioned in the application, and the Secretary was instructed to ask the applicants whether the particulars stated in their letter were correct.

Mr. J. W. Jaegel explained his system.

It was moved, seconded and adopted that the Board at its rising adjourn until Tuesday, September 29, 1885, at 11 a. m.

Board adjourned accordingly.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23d street, on Tuesday, September 29, 1885. Present: Commissioners Loew, Hess and Moss.

The minutes of the last meeting were read and approved.

Communication read from the secretary of the Fire Department in reply to the resolution passed at last meeting, stating no permission is given to the electric light companies to suspend wires from poles belonging to the department, but that where wires have been placed in too close proximity brackets have been affixed to the poles for protection.

Communication read from Mr. Theo. A. Vail, president of the Metropolitan Telephone & Telegraph Company, asking for permission to place wires underground from Wall street and Water street along Water to Roosevelt street, along Roosevelt from Water to South street, and along South street to No. 180, was laid over until next meeting for consideration.

Communication read from The American District Telegraph Company, enclose diagram of one section of their overhead wires, ordered to be placed on file.

Communications from Benzette Williams, No. 171 La Salle street, Chicago, Ill.; S. J. Fague, Washington, D. C.; H. L. Gautt, No. 323 Lanvale street, Baltimore, Md.; M. Hettinger, Freeport, Ill.; A. R. White, Mt. Airy avenue, Philadelphia, Pa.; R. H. Corbett, Nos. 31 and 33 Broad street, N. Y. City.; Wm. Lenderoth, Perth Amboy, N. J.; T. A. Haynes, No. 431 West 100th street, N. Y. City, were ordered to be filed for consideration.

Mr. Daniel Moore, representing Colonel Wm. Mackintosh, explained that gentleman's system of laying wires underground.

Mr. David Brooks, of Philadelphia, explained his system and said that if it is adopted by the Commission he had the authority of Dr. Norvin Green to say that money would be found, a company organized, and the wires laid underground without delay.

The New York Telegraph Company explained their plan and submitted specimen cables.

Mr. J. Jaegel submitted new model of his plan for placing conduit under car tracks.

Board adjourned until Thursday, October 1, at 11 a. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Thursday, October 1, 1885, at 11 a. m. Present: Commissioners Loew, Hess and Moss.

Minutes of last meeting read and approved.

Communications read from Mr. Wm. Gosling, Newport, R. I.; C. F. Dunderdale, Chicago, Ill., and ordered to be placed on file.

Mr. Sidney L. Shelbourne, president of the N. Y. Electric Lines Company, attended and explained the system of insulation proposed by his company.

Board adjourned until Friday, October 2.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, Friday, October 2, 1885. Present: Commissioners Loew, Hess and Moss.

The minutes of the last meeting were read and approved.

Mr. L. Shelbourne, president of the New York Electric Lines Company, continued his explanation of their system proposed by his company.

The Board then adjourned until Saturday, October 3.

Saturday, October 3, 1885. Present: Commissioners Loew and Moss.

The representative of Clark's sidewalk system, who had appointed to-day for his explanation of the proposal, not being present, it was agreed to adjourn until Tuesday, October 6.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, Tuesday, October 6, 1885. Present: Commissioners Loew, Hess and Moss.

The minutes of the last meeting were read and approved.

Mr. Edward Clark, patentee of a curb, gutter and sidewalk system for laying wires underground, gave an explanation of it and filed his patents.

Mr. David Brooks gave an invitation to the Commissioners to examine the working of his system in Philadelphia when convenient.

The Board adjourned until Wednesday, October 7, at 11 a. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, Wednesday, October 7. Present: Commissioners Loew, Hess and Moss.

Minutes of the previous meeting were read and approved.

Mr. Wauhope Lynn, No. 25 Chambers street, submitted plan and specifications from George N. Cushing, for conduit of sewer pipe to run under the street gutters, which was ordered to be filed for consideration.

Board adjourned until Thursday, October 8, 11 a. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Thursday, October 8, 1885. Present: Commissioners Loew and Moss.

Minutes of the previous meeting were read and approved.

Plan from Mr. C. H. O'Bryan ordered to be placed on file.

Mr. E. H. Austin, No. 62 Reade street, submitted plan and model of his system of underground pipes with glass insulators. Ordered to be placed on file.

Board adjourned until Friday, October 9, 11 a. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Friday, October 9, 1885. Present: Commissioners Loew, Hess and Moss.

The minutes of the previous meeting were read and approved.

Mr. Frederick Anderson, representing the Metropolitan Telephone and Telegraph Company, appeared in support of the application for permission to lay a temporary conduit from Wall street to the testing office on South street, and stated that the company would be willing to undertake that all the poles now on the route would be broken down. He said also that the company would undertake that the permission if granted would not prejudice the Commission in any future action they might take, but simply leave the position in *statu quo*. He was requested to have the company embody their intentions in an application to the Board.

Mr. J. W. Horner explained his patent underground wire protector.

Board adjourned until Monday, October 12, at 11 a. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Monday, October 12, 1885. Present: Commissioners Loew, Hess and Moss.

The minutes of the previous meeting were read and approved.

Mr. Theo. Putnam, represented by Mr. Wm. Courteney, of No. 15 Dey street, submitted plan and drawings of cast iron conduit, with separate compartments, for each class of service.

Mr. David Brooks submitted copies of the Journal of the Society of Telegraph Engineers.

Mr. G. B. Pennock explained the Pennock Underground Conduit, on behalf of the Pennock Underground Conduit & Surface Telegraph Company.

Mr. Marcus Marx, representing the Asphalted Wrought Iron Pipe Company, explained his system and submitted proposal and model.

Plans received from John D. Townsend, The Lennon Conduit Company, and ordered placed on file.

Board adjourned until Tuesday, October 13, at 11 a. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, Tuesday, October 13, 1885. Present: Commissioners Loew, Hess and Moss.

The minutes of previous meeting were read and approved.

Mr. R. S. Waring, Mr. G. L. Wiley and Mr. McElroy, representing the Standard Underground Cable Company, attended and explained the merits of their cable for underground service.

Mr. J. J. Greenough, of Syracuse, N. Y., presented drawings and specifications of a conduit of cement or vitreous tile, with heated and dry air forced in.

Mr. Benzette Williams, of Chicago, explained his continuous cellular system.

Board adjourned until Wednesday, October 14, at 11 a. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, Wednesday, October 14, 1885. Present: Commissioners Loew, Hess and Moss.

The minutes of previous meeting were read and approved.

Mr. J. J. Greenough supplemented his statement of last meeting.

Mr. McElroy, of the Standard Cable Company, read telegram certifying to the satisfactory working of their cables.

Mr. J. S. DuBois, representing the Manhattan Electric Conduit Company, submitted specification and model of conduit.

Mr. E. T. Stephens also submitted plan and model.

The Hastings Pavement Company appeared and submitted their material as suitable for making conduit.

Board adjourned until Thursday, October 15, at 1.30 p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, 23 West 23rd street, on Thursday, October 15, 1885. Present: Commissioners Löew, Hess and Moss.

The minutes of the previous meeting were read and approved.

Communications from Colonel A. Derron, Patterson, N. J.; T. J. Perrin, Averill Insulating Company, E. D. Prichard, United States Telegraph Wire Conduit Company, Callender Insulating Company, M. F. Aguayo, Geo. Richardson, D. H. Dorsett, B. F. Carpenter, J. S. Steves, Ronald McDonald, Thos. G. Turner, M. Dittenhoffer, Colonel Chester and The Wheaton Subway Electric Company.

Mr. D. H. Dorsett submitted specimen of his underground conduit and filed plan for laying it through New York.

Professor Elisha Gray, of Chicago, spoke in support of Dorsett's system, and said that it was the most successful method he had been able to find, and presented less difficulty than any other.

Mr. Geo. Richardson, of Philadelphia, submitted model of his sewer pipe as adapted to conduit.

Mr. Frost, representing the Canton Manufacturing Company, of Boston, gave notice of their intention to file proposals.

Colonel Chester explained his method.

Mr. James Smith and Mr. Cheever, of the Okonite Company, submitted drawings and exhibit of their cable.

Judge Koch, on behalf of the Wheaton Subway Electric Company, submitted model and filed proposal.

Mr. B. F. Carpenter filed drawings of his subway as proposed.

Dr. Gough, on behalf of Mrs. Cogswell, exhibited model of wires insulated by glass.

Mr. D. H. Johnstone, of the American Sectional Conduit Company, of Philadelphia, exhibited drawings and invited Commission to inspect his system as laid in Philadelphia.

Mr. Thos. G. Turner filed drawings and models of his conduit and wires.

Board adjourned.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Tuesday, October 20, at 11 a. m. Present: Commissioners Loew, Hess and Moss.

Communications were read from Theo. N. Vail, Esq., president of the Metropolitan Telephone and Telegraph Company, and the Secretary was instructed to write the following:

October 20, 1885.

THEO. N. VAIL, ESQ.,

DEAR SIR—The Commissioners of Electrical Subways request me to acknowledge receipt of your favors of 14th and 15th insts., and to inform you that they have under consideration the adoption of a general plan for placing underground all the electrical conductors required in the city.

With reference to your application for permit to lay an underground service as stated, viz., "from the corner of Wall street and Water street, along Water to Roosevelt, along Roosevelt to South street, along South street to testing office at No. 180." The Board desires to be informed specifically whether if such permit be granted you will remove all the poles belonging to your company now on the route named, and also whether when a general system for placing wires underground shall have been adopted you will conform to the requirements of this Commission.

Very respectfully yours,

THEODORE MOSS, Secretary.

Board adjourned until Wednesday, October 21.

Wednesday, October 21, 1885, Commissioners Loew and Moss present.

Minutes of previous meeting read and approved.

Proposal made by the Canton Manufacturing Company, of Boston, and model submitted.

Board adjourned until Monday, October 26, 1885.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, Monday, October 26, 1885. Present: Commissioners Loew, Hess and Moss.

Minutes of previous meeting read and approved.

Communications read from The N. Y. Telegraph Company, offering to lay a section of their system for the inspection of the Commission. Secretary instructed to reply that they would inspect the portion in Brooklyn.

Proposal and specification read from J. Howard White and ordered to be filed.

Board decided to meet daily in executive session.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Thursday, October 29, 1885. Called by direction of the President. Present: Commissioners Loew, Hess and Moss.

Minutes of the last meeting were read and approved.

Application read from The Edison Electric Illuminating Company for permission to lay a conductor underground from No. 139 East 36th street to the house on southeast corner of Lexington avenue and 36th street; it was

Moved, seconded and carried that said application be granted on condition that when a general system for placing the wires underground shall have been adopted, said company shall cause this conductor to be placed in conformity therewith.

The Secretary was directed to write the company, and accordingly the following was written:

October 29, 1885.

MESSRS. THE EDISON ELECTRIC ILLUMINATING COMPANY,

GENTLEMEN—I am instructed by the Board of Commissioners of Electrical Subways to inform you that they have decided to grant you the necessary permit to place a conductor underground from No. 139 East 36th street to the southeast corner of Lexington avenue, with the stipulation that when a general underground system for electrical conductors shall have been decided upon you will place this conductor in conformity therewith.

Yours truly,

THEODORE MOSS, Secretary.

Plans and drawings submitted from The Bentley & Knight Company and G. A. Benjamin.

Moved seconded and carried that the Board adjourn until called by the President.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the office, No. 23 West 23rd street, on Monday, November 9, 1885. Called by order of the President. Present: Commissioners Loew, Hess and Moss.

The minutes of the previous meeting were read and approved.

Communications from John J. Schillinger and Marcus Marx were read and ordered to be filed.

Also from E. H. Johnson, president of Edison Electric Illuminating Company, accepting the stipulation made at last meeting in regard to laying a conductor in East 36th street.

Letter read from The Metropolitan Telephone and Telegraph Company withdrawing their previous applications for permit to lay an underground service and asking permission to repair the poles on the route specified to make them secure for the Winter. The Secretary was instructed to write the Commissioner of Public Works inquiring whether any repairs were necessary for the poles mentioned.

Meeting adjourned until Wednesday, November 11, at ten a. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Wednesday, November 11, 1885. Present: Commissioners Loew, Hess and Moss.

It was decided that on Friday, the 13th inst., the Board will proceed to Philadelphia to examine the various underground systems in operation there, and on Saturday go to Washington for the same purpose.

Board adjourned accordingly, to be called for next meeting by the President.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Friday, November 19. Present: Commissioners Loew, Hess and Moss.

Minutes of previous meeting read and approved.

Communication read from Mr. D. Lowber Smith, Deputy Commissioner of Public Works, inclosing report from Assistant Engineer H. Loomis, stating that the line of poles on Water and other streets for which application to repair had been made by the Metropolitan Telephone Company, did not require any repairs to secure them for the

coming Winter. The secretary was instructed to forward copy of this report to The Metropolitan Telegraph and Telephone Company, and to ask them to specify what repairs were considered necessary by them.

The following was accordingly written:

November 20, 1885.

THEO. N. VAIL, ESQ.,

DEAR SIR—I am instructed by the Commissioners to inclose you copy of a report made by the Department of Public Works, on your application for permission to repair the pole lines on the Water street route. In view of this report, the Commissioners will be glad to know what repairs are considered necessary by your engineers.

Yours truly,

THEODORE MOSS, Secretary.

The Commissioners decided to visit Chicago and inspect the underground system there in operation.

Board adjourned subject to call of the President.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Thursday, December 3, 1885. Present: Commissioners Loew, Hess and Moss.

It was proposed and agreed that all plans and proposals filed with the Commission be carefully examined by Mr. John Thomson (expert), and that he be desired to report upon same.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held Saturday, December 5, 1885. Present: Commissioners Loew and Moss.

Mr. John Thomson, mechanical and electrical engineer, appointed to consider the various systems submitted, reported on the following:

- | | |
|---------------------------------------|----------------------------------|
| No. | No. |
| 1. E. C. Townsend. | 5. Universal Insulating Company |
| 2. M. H. Devey. | 6. Callender Insulating Company. |
| 3. T. A. B. Putnam. | 7. B. F. Carpenter. |
| 4. Accessible Underground Conduit Co. | |

Board adjourned until Saturday, December 12.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Thursday, December 10, 1885. Present: Commissioners Loew and Moss.

Minutes of previous meeting read and approved.

Communication read from N. Y. Electrical Subway Company, asking the Commissioners to visit their office to inspect their system.

Commissioner Loew was requested to attend to this.

It was decided to invite the representatives of The Metropolitan Telegraph and Telephone Company to a hearing on Friday, December 11, at 2 p. m., or if not then convenient, to meet the Board on Monday, December 14, at 3 p. m.

Board adjourned accordingly until Saturday, December 12.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held on Saturday, December 12, 1885. Present: Commissioners Loew and Moss.

Mr. John Thomson having examined the following systems presented his report:

No.	No.
8. G. D. Sutton.	25. Gilman.
9. G. B. Pennock.	26. S. M. Mowbray.
10. Wm. Hendley.	27. R. McDonald.
11. Chas. Schierhurst.	28. The Okonite Company.
12. Brooks Underground Company.	29. Nevins & Company.
13. American Mfg. Electric Wire Co.	30. Julius J. Jagel.
14. Hussey Electric Light & Power Co.	31. C. D. Shrieves.
15. New York Electric Lines Co.	32. F. R. Betzel.
16. Averill Insulating Company.	33. B. Williams.
17. H. Grigg.	34. E. H. Hoffman.
18. Allan & Shead.	35. W. C. Barney.
19. S. M. Chester.	36. Standard Mfg. Conduit Company.
20. J. H. Bowly.	37. S. C. Jackson.
21. E. Heyleyer.	38. B. M. Dryer.
22. I. W. Horner.	39. Ege & Dobson.
23. H. E. Dey.	40. Bentley & Knight.
24. F. Beilstein.	

Board adjourned until Monday, December 14.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Monday, December 14, 1885. Present: Commissioners Loew, Hess and Moss.

Minutes of previous meeting read and approved.

Mr. J. P. Davis, representing the Metropolitan Telegraph and Telephone Company, attended on the invitation of the Board and conversed on the general question of the requirements of the telephone service in the city. He expressed his preference for some system that would keep the telephone and the other delicate electrical services entirely away from the telegraph and electrical wires, but reiterated the statement made in the letter of October 15 that the Company would be willing to come into any general plan that was adopted and shown to be practicable.

Board adjourned until December 15 at 3 p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Tuesday, December 15, 1885. Present: Commissioners Loew, Hess and Moss.

Minutes of last meeting were read and approved.

Mr. T. G. Turner and Mr. G. N. Robinson presented plans of their conduit and system of laying wires.

Communications read from the Metropolitan Telephone and Telegraph Company, stating their desire was to reconstruct the Water street pole line. On motion this was ordered to lie on the table.

Communications read from Mr. Wm. D. Gates, of Chicago, claiming that the system laid down in Chicago is an infringement on patents held by him. Ordered to be placed on file.

Application read from The Pennock Underground Conduit and Surface Telegraph Company for permit to lay down their underground system according to map presented. Secretary was instructed to invite them to appear before the Board December 16 at 3 p. m.

Board adjourned accordingly.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Wednesday, December 16. Present: Commissioners Loew and Moss.

Minutes of previous meeting read and approved.

Mr. C. W. Hassler, attorney for The Pennock Underground Conduit and Surface Telegraph Company, appeared in support of application for permit to lay underground service, and argued that as the company was a new one formed for operating telegraphs, and they had filed plans within sixty days from the date of their incorporation, they had a right, under the law, to exemption from any general plan. At the close of his argument the Commissioners promised to take the subject into consideration.

Commissioner Hess was appointed a committee of one to arrange with the American Underground Wire Company for the experiments they desired to make.

Board adjourned subject to call of the Chair.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, on Tuesday, December 29, 1885. Present: Commissioners Loew and Moss.

Minutes of last meeting read and approved.

Communication read from New York Electric Lines Company, asking that an examination of their models be made. Ordered to be laid over.

Letter from Averill Insulating Conduit Company, making formal proposition to lay underground system on terms specified. Ordered placed on file.

Letter from Benzette Williams, with supplementary plans as arranged by him and Bentley & Knight Co., also stating he transferred his interest to the Consolidated Telegraph and Electrical Subway Company. Mr. Williams and Mr. Bentley explained at length their amended plans.

Letter read from the Consolidated Telegraph and Electrical Subway Company, making formal proposition to lay the system as shown by Messrs. Williams and Bentley. Plans referred to Mr. J. Thomson for report and proposal laid over for future consideration.

Board adjourned until December 30, 1885, at 3.30 p. m.

Minutes of a meeting of the Board of Electrical Commissioners, held on Saturday, December 19, 1885. Present: Commissioners Loew, Hess and Moss.

Mr. John Thomson reported that he had examined the following:

No.		No.	
41.	C. H. Sewall.	73.	M. Dittenhofer.
42.	S. J. Fague.	74.	A. Derron.
43.	A. R. White.	75.	Lennon Electric Con. Co.
44.	C. Dunderda Co.	76.	Cyrus Emery.
45.	Geo. A. Cushing.	77.	Manhattan Electric Con. Co.
46.	C. H. O'Bryan.	78.	Dowse & Grimshaw.
47.	I. D. Townsend.	79.	E. H. C.
48.	Asphalted W. I. Pipe Co.	80.	Canton Mfg. Company.
49.	T. A. Haynes.	81.	Dr. Gough.
50.	H. L. Gault.	82.	T. Wallace.
51.	J. B. King.	83.	I. Shattrick.
52.	W. Lendroth.	84.	Hastings Pavement Company.
53.	New York Telegraph Company.	85.	United States Wire Company.
54.	E. H. Austin.	86.	T. G. Turner.
55.	E. Clark.	87.	W. Howard White.
56.	E. E. Ries.	88.	M. Algnber.
57.	E. Collins.	89.	American Sectional Mfg. Co.
58.	R. H. Corbett.	90.	G. H. Benjamin.
59.	E. T. Stephens.	91.	Mr. Peers.
60.	J. L. Steves.	92.	Edison Electric Light Company.
61.	M. J. Dewey.	93.	J. J. Schillinger.
62.	D. S. Mathews.	94.	T. P. Wykoff.
63.	J. J. Greenough.	95.	Chisholm Patterson Conduit Co.
64.	Seymour.	96.	John C. Goodridge.
65.	T. J. Perrin.	97.	A. A. Kundson.
66.	D. H. Dorsett.	98.	D. Brooks, Jr.
67.	E. D. Pritchard.	99.	M. Hettinger.
68.	M. F. Agnayo.	100.	Jacques & Eustis.
69.	Wheaton Sub. Electric Company.	101.	Day Kerite Co.
70.	G. Richardson.	102.	Eastern Electric Construction Co.
71.	Wm. Gosling.	103.	W. F. Quimby.
72.	H. D. Rogers.		

Board adjourned until December 29, 1885.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held on December 30. Present: Commissioners Loew, Hess and Moss.

Mr. John Thomson reported that he had examined the plan proposed by the Consolidated Telegraph and Electrical Subway Company and gave his opinion of it.

He was requested to submit his report in writing.

Board adjourned until Monday, January 4.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held on Monday, January 4, 1886. Present: Commissioners Loew, Hess and Moss.

Communication read from W. H. Johnstone, president American Sectional Underground Conduit Company, and ordered placed on file.

The following letter was ordered to be sent to the Attorney-General:

23 West 23rd St.

NEW YORK, January 5, 1885.

HON. DENNIS O'BRIEN, Attorney-General:

DEAR SIR—We desire your opinion as to the power of this Commission upon the following matters: First, Provided we should select a plan from those presented, have we the power, under the law, to give permission or authority to or make a contract with a private corporation to construct the conduit, or subway, provided the same is constructed without cost to the City, State or companies, and a satisfactory bond given to the Commission to protect against damages from patent suits, etc., and a proper guarantee that the cost to companies for use of same shall in no way exceed the cost of maintenance of overhead wires. Second, Have we the power to fix a rental to be paid by the companies for the use thereof and the authority to compel the use of the same by all companies or persons owning or controlling electric wires; the Commission to retain official supervision of, and direction of routes, plans, construction, etc.

Very respectfully,

THEODORE MOSS, Secretary.

STATE OF NEW YORK,

OFFICE OF THE ATTORNEY GENERAL,

ALBANY, January 6, 1886.

THEODORE MOSS, ESQ., Secretary, Etc., 23 West 23rd Street, N. Y. City:

DEAR SIR—Your communication of the 5th inst., requesting my opinion on two propositions stated therein, has been duly received.

A proper reply to the same requires a brief examination of the Acts, Chapter 534, Laws of 1884, and Chapter 499 of the Laws of 1885, as to the powers granted to, and duties imposed upon, the Commissioners of Electrical Subways of the City of New York.

The Act of 1884 was plain in its terms and required that after the passage of that act, all telegraph, telephonic and electric light wires and cables in any incorporated city of the State having a population of five hundred thousand or over, should be placed under the surface of the streets, lanes and avenues of the said city. As to the telegraph, telephonic, electric or other wires and cables, including telegraph poles and other appurtenances thereof, which were at the time of the passage of this act upon the surface of the streets and avenues of any of said cities, the owner or person controlling the same was required to remove the same from the surface of all streets

or avenues in every such city before the 1st day of November, 1885, and in the event of failure to so remove, the local governments of the cities were directed to remove without delay all such wires, cables and poles, wherever found within the limits of their respective cities.

The Act of 1885 was an addition to the Act of 1884, except in so far as the provisions of the Act of 1884 were repugnant to the Act of 1885. The Act of 1885 provided for the appointment of a Board of Commissioners whose duty it was to enforce the provisions of the Act of 1884, and the Board of Commissioners so constituted was to be in lieu of the powers granted by the Act of 1884 to the local governments to the different cities to which the act was applicable.

It was further made the duty of the Board of Commissioners to cause to be removed from the surface of the streets and to put, maintain and operate underground, wherever practicable, all electrical wires and cables used in the business of any of the companies referred to, in any street, avenue or other highway in the city where such board is situated.

In the event of the willingness of any company operating, or intending to operate, electrical conductors in any such cities, it became necessary to obtain the approval by the Board of the plan of construction proposed by the company, to file with the Board a map or maps, showing the streets or avenues which were desired to be used for such purpose, and giving the general location, dimensions, course of the underground conduits desired to be constructed.

The approval by the Board of the plan of construction was to be had before any conduits were constructed, and the general supervision of the removal of the wires and the manner in which they should be laid under ground was left to, and enjoined upon, the Board of Commissioners.

The Board of Commissioners were to carefully investigate any and all methods proposed by any company and require, before the approval of any such method, that all conductors, when constructed, should be underground.

In the event that no suitable plan was proposed by any of the companies, or in use by them within sixty days after the passage of the act, it became the duty of the Board to cause to be devised and made ready for use such a general plan as would meet the requirements of the act, and after the adoption of such general plan by the Board of Commissioners the company or companies having failed for sixty days to present or propose any method for the conducting of the wires underground, the Board was empowered to compel all companies operating electric wires to use the subway prepared in accordance with the authority given them to make ready for such use a general plan for the conducting of wires underground.

Under the provisions of the Act of 1885, the Board of Commissioners have power to devise a general plan to meet the requirements of that act and of the Act of 1884, for the laying of wires underground, to construct such a subway as will meet the requirements of the different companies, as to space, accessibility, etc., and to compel all companies operating electric wires to use such subway.

The construction of such subway may be had either by contract with a private corporation or person, or in the discretion of the Commissioners, by labor employed by them.

I do not find any provision in either of the acts referred to in relation to the rental

of space in the subway to persons or companies owning or controlling electric wires, further than that contained in Sections 7 and 8 of the Act of 1885.

Section 7 of the Act of 1885 provides the amount of salary to be paid to each of the members of the Board of Commissioners by the Comptroller of the State, and the Comptroller is also authorized to audit and pay all necessary and incidental expenses of such Board of Commissioners and subsequently to assess upon and collect from the several companies which were required to place and operate their conductors underground the amount of such salaries and expenses.

It would, therefore, seem that the amount of rental for the use of the subway, to be paid by the companies, was to be made with reference to the number of miles of wires operated within the limits of any such city.

Very truly yours,

D. O'BRIEN, Attorney-General.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, January 18, 1886. Present: Commissioners Loew, Hess and Moss.

Mr. J. W. Chisholm, representing the Chisholm-Patterson Company, explained his system of laying iron pipes in gutters and having a separate pipe for each cable.

Mr. Geo. Richardson filed drawings of his system of conduits made from carbonized stone pipe, and explained his method of making joints and connections.

Board adjourned subject to the call of the chair.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 23 West 23rd street, January 28, 1886. Present: Commissioners Loew, Hess and Moss.

Mr. John Thomson, at the request of Commissioner Loew, explained the drawings and specifications of the system proposed by the Consolidated Telegraph and Electrical Subway Company, and gave his reasons in favor of such plan.

Mr. R. W. Pope, at the request of Mr. Loew, expressed his concurrence in the favorable opinion given by Mr. Thomson, and declared himself as strongly of opinion that an insulating material was superior as a conduit to a material that was a conductor.

Mr. I. P. Davis, vice-president Metropolitan Telephone Company, agreed with

Messrs. Thomson and Pope, and said that as far as telephone wires were concerned there was no doubt an insulating material was much better than any other. He had tested the material proposed—asphaltum concrete—for a year and was satisfied as to its durability. Heat might affect it, but where there was any liability to such danger it could easily be protected.

Mr. E. H. Johnson, president Edison Electric Light Company, dissented from views of previous speakers and questioned the benefits said to be derived from the use of concrete, which he said was much less suitable than iron.

Mr. A. B. Chandler, president United Lines Company, also doubted the durability and merits of concrete.

A general discussion of the material and plans then took place, after which the Board adjourned, subject to the call of the Chair.

February 4, 1886.

Meeting called to give hearing to Mr. D. H. Dorsett, but, in the absence of Commissioner Hess, was postponed.

Mr. Dorsett filed copies of letters bearing upon the "durability of his asphaltum material."

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, Thursday, February 18, 1886. Present: Commissioners Loew, Hess and Moss.

Commissioner Hess offered the following resolution:

Resolved, That this Board request Mr. Thomas A. Edison to act as consulting electrician and engineer to the Commission, and that he be requested to meet this Board at a meeting to be held on Tuesday, February 23.

By consent this was laid over until Saturday, February 20.

Board adjourned accordingly.

REPORT OF THE NEW YORK ELECTRICAL SUBWAY COMMISSION.

The following is the report in full made by the New York Commissioners, April 28, in accordance with Senate resolution:

To the Hon. the Senate of the State of New York:

In compliance with the resolution passed by you, April 19 inst., we, the undersigned, comprising the Commission of Electrical subways for the City of New York, report as follows:

"With regret we first refer to the death of our colleague and President, Mr. Charles E. Loew, and it may not be inappropriate to add in this connection that in his death the Commission has lost a member of exceptional executive ability, who apparently was animated by the controlling object of selecting a system best suited to the requirements of the public, and of the electrical companies.

"We formally organized as a board July 20, 1885. All corporations, private companies or persons on record as controlling or operating electric conductors in the City of New York were then immediately notified to file with us within sixty days, as stipulated by the statute, maps or plans illustrating such underground systems as they would desire or prefer to construct and operate. Within that time but one response was made to this call, namely, that of the Metropolitan Telephone and Telegraph Company. But as their proposal did not refer to the general or inclusive use of any or all classes of electric conductors being specifically applicable to telephonic service only, we could not regard it as coming within the scope contemplated by law. Therefore, it devolved upon us to act under the alternative provisions of the statutes, namely, to select, devise, or cause to be devised, such a general plan as would meet the requirements of the act, and to cause the same to be constructed as soon as might be consistent with the convenient use thereof by the public; and to this end we have since been actively engaged, as will hereafter more fully appear.

"The following tabulation, showing the mileage of wire now operated in this city, is based on the statement made to us by the electric companies:

	Overhead. Miles.	Underground. Miles.
Telephone	5,446	614
Telegraph	5,981	186
Electric light.....	431	56
Messenger service.....	1,099	...
Stock quotations.....	389	...
Miscellaneous	300	...
Police telegraph.....	60	...
Fire alarm.....	850	150
Total	14,556	1,006
Underground	1,006	
Grand total.....	15,562	

"It is safe to assert, however, that an actual survey might considerably change this showing. Inventors, electricians and engineers generally were invited by six days' public advertisement to submit plans and proposals pertinent to the subject, the indi-

vidual incentive to which was the chance of adoption of a system from those presented. In reply to this invitation 118 different plans have so far been submitted, of which up to the time of Mr. Loew's illness 105 had been classified and officially passed upon. Opportunity was frequently given to inventors, experts and promoters of these plans, and also to the representatives of electric companies to orally describe their plans and express their views.

"The underground systems of Philadelphia, Washington and Chicago were personally examined by us during November, 1885, or rather such embryo systems as there exist. After having thus exhaustively taken up the different branches of procedure which, under the law and to the best of our belief and ability, seemed to promise the best results, we finally convened for conclusive action late in December of last year, and but for the untimely illness and death of our colleague we would undoubtedly ere this have reached a unanimous conclusion. Our future action, however, will now wait upon the appointment of his successor, to whom the results of our investigation will be submitted. The difficulties which surround the successful solution of the underground wire problem in this city are of an extent and magnitude of which the public, as voiced in the general press at least, have no adequate comprehension; but it does not appear to us as within the requirements of your resolution or the province of this statement to exhaustively go over the ground, technically or otherwise, except that we are prepared to say, as a matter of belief due to our investigation and study of the subject, that we shall be able within a reasonable time after the present vacancy in our Board is filled to submit a comprehensive plan of a system which will prove satisfactory to the public, not prohibitory or ruinous to the electric companies, and creditable to ourselves. Our action at least shall be due to the best comprehension of and judgment upon the subject of which we are capable, as to act with less than complete confidence the outcome would appear to us as rash and unwise."

Respectfully submitted,

THEO. MOSS,

JACOB HESS,

Commissioners.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, Saturday, February 20, 1886. Present: Commissioners Loew, Hess and Moss.

Mr. Hess, by consent, withdrew his resolution offered at the last meeting.

Mr. Thos. A. Edison submitted and explained his plan for a general underground system.

Mr. John Thomson was instructed to examine into it and report.

Board adjourned, subject to call of the Chair.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Wednesday, May 27, 1886. Present: Commissioners Hess, Moss and Flower.

Hon. R. P. Flower presented his commission from Gov. David B. Hill, dated May 25, 1886, appointing him to succeed the late Charles E. Loew.

Commissioner Hess proposed that Commissioner R. P. Flower be appointed President of the Board. Agreed to.

Minutes of the previous meeting were read and approved.

The following resolutions were offered and unanimously agreed to:

Whereas, This Commission has sustained a most serious loss by the death of its President, Mr. Charles E. Loew, whose ability and integrity have been conspicuously shown in the many offices of public trust which he has held, and

Whereas, His death is the more lamentable at this particular time when his close study of and searching investigation into the problem before us would have been of the greatest value in satisfactorily accomplishing the object of this Commission.

Resolved, That the Secretary be instructed to convey to the bereaved family of our late brother commissioner an expression of our deep and earnest sympathy in the loss they have sustained, and that this resolution be ordered spread upon the minutes of this Commission.

The United States Illuminating Company applied for permission to transfer their poles from 44th street from Third avenue to East River to 29th street, east of Third avenue, and stated that the consent of all property owners or lessees affected had been obtained.

Resolved, That as such transfer is absolutely necessary for the continuance of the company's service in that locality, and as the permission of all property owners or lessees in 29th street has been obtained, the transfer be permitted on condition that the pole are erected for a temporary purpose only, and that the company file with the Secretary copies of the property owners' or lessees' consents.

Application read from the Edison Electric Illuminating Company for permission to lay electric light wires from 23rd street to 59th street, and from Third avenue to Eighth avenue.

Resolved, That said application be laid over for consideration at the next meeting.

Application from the Metropolitan Telephone and Telegraph Company for permission to lay "Brooks" cable on 125th street from Tenth avenue to East River was also laid over.

The following resolution, offered by Commissioner Moss, was unanimously adopted:

Resolved, That the several plans which have not yet been acted upon be referred to Mr. John Thomson for examination and report, and that he be requested to submit to this Board at its next meeting plans and specifications and a report for the consideration of the Board, which report shall embrace such features from plans submitted and from data obtained from the previous investigations of this Commission as may be necessary to guide them to an intelligent conclusion for the adoption of a general plan.

Meeting adjourned subject to the call of the Chair.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Wednesday, June 16, 1886. Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

Communications read from Mr. G. J. Johnson, Washington, D. C.; Mr. T. G. Turner, New York; Chas. W. Whitney, Stewart Building; Senator Thomas, Continental Conduit Company; Albert Lovie & Co., Baltimore; Smith & Milligan, Boston; William Walters, Philadelphia, and were ordered placed on file.

The Continental Conduit Company invited the Board to inspect their model conduit at their room, No. 415 West 42nd street, and it was agreed to visit them on Friday next at 3.30.

Letter read from Alex. C. Chenowith, asking for a hearing. It was agreed to invite him before the Board on Tuesday, 22nd inst., at 3.30.

The Siemens-Halcke Cable Company also applied for a hearing, and were invited to appear at the same time.

The Board adjourned until Tuesday, June 22.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Tuesday June 22, 1886. Present: Commissioners Flower, Hess and Moss.

Mr. Chas. L. Clarke and Mr. J. F. Bailey, representing the Siemens-Halcke cable as laid in Germany, and suggested the use of an iron pipe in conjunction with same for the city. Not being prepared with plans and specifications of the method they proposed, they were requested to file same as soon as possible.

Alex. C. Chenoweth explained his plan for providing a conduit in connection with cable railroads; said conduit to form part of the space beneath the tracks and to be constructed by the cable company.

Col. Paine, engineer of the Third Avenue Railroad, further explained the method with regard to its economy.

Ronald McDonald filed drawings and specifications of his wood conduit with septums for cables and explained his plan.

Board adjourned until Wednesday, June 23, 1886.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, on Wednesday, June 23, 1886. Present: Commissioners Flower, Hess and Moss.

Mr. Sidney F. Shelbourne, president of the New York Electric Lines Company, submitted drawings of a conduit made of concrete with zinc lining around chambers for different classes of wires.

Mr. Julius Jagel further explained his plan for conduit to run in connection with horse-car tracks.

Mr. T. Wallace, president Wallace Telephone Company, submitted drawings of a tunnel to provide space for conductors and pipes for future water supply; also his system of distributing from towers at intervals of about half a mile.

Commissioner Flower gave notice of his intention to introduce a series of resolutions at a meeting to be held on Wednesday, June 30.

Board adjourned until Tuesday, June 29.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Tuesday, June 29, 1886. Present: Commissioners Flower, Hess and Moss.

Application read from the Western Union Telegraph Company for permission to renew a pole on the corner of 26th street and Broadway.

It was resolved that permission be granted for the erection of a new pole of the same dimensions as the old one, subject to the approval of the Commissioner of Public Works.

The following new plans were presented by R. D. Radcliffe, E. B. Shafer, Samuel Essick, J. F. Munsie and May, J. M. Weed—the Gore system.

Communication received from James Boys and S. S. Ely, protesting against Allan & Shead claiming ownership of the Mackintosh system of patents.

Reports on the following proposals were submitted by Mr. John Thomson: N. F. Quimby, Wilmington, Del.; R. R. Taylor, Washington, D. C.; Smith & Milliken, Boston; I. W. Horner, New York; I. A. Hargan, Chester, Pa.; Continental Construction Company, New York; A. E. Lytle, Chicago; Standard N. G. Cable Company, New York; H. D. Rogers, New York; I. H. Gould, Philadelphia; Geo. W. Moore, Jersey City; W. E. Banta, Springfield, O.; W. B. Rogers, Philadelphia; A. C. Chenoweth, New York; Geo. S. Cox, Philadelphia.

Communication read from the Metropolitan Telephone and Telegraph Company enclosed map of 48 miles of conduit which they wish to lay. Ordered to be left over.

Board adjourned until Wednesday June 30, 1886.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Wednesday, June 30, 1886. Present: Commissioners Flower, Hess and Moss.

Commissioner Flower presented the following report, which, after being read, was, on motion of Commissioner Moss, adopted as the report of the Commission:

The work of the Commission is capable of being divided and subdivided into a series of questions, each of which can be provided for as it comes up by resolution of the Commission. I have made certain of these divisions, which I will lay before the Commission.

Some of the questions have been thoroughly considered by the Commission, and

I believe we are prepared to vote upon them at this time; others have not yet been considered, and I have certain propositions to make looking to our better information in respect to these.

The questions I have to propose are these:

1st. What form of subway will the Commission adopt? Under this question arise the following:

- (1.) Material to be used.
- (2.) Form and method of placing the wires therein.

2d. How shall the subway be laid? And under this:

(1.) What particular provisions are necessary for each different kind of electrical service, and for each particular locality?

(2.) What mode of distribution shall be enforced.

(3.) What capacity is required for each different locality.

3d. How shall the laying and maintaining of the subway be provided for, and the whole and parts thereof and the wires therein controlled?

I am advised that the Commission is not bound to accept the plans or patents of any one man or number of men, and it seems to me that each of the several questions to be acted upon by the Commission should be met separately and distinctly, in order that that which is at best merely experimental may be tried in the best manner possible.

First, then, as to the form or plan of subway, its material, and the manner of placing the wires in it.

The Commission have had before them many plans and forms of subway and have devoted much time to hearing explanations and arguments and the opinions of experts. It has been a cardinal principle with them to hear every one who might present himself and desire to be heard, and they will continue to act upon the same principle as to each of the several questions before them until all are decided upon.

Nearly one hundred and fifty plans, models, etc., have been submitted to the Commission which may be classed roughly as follows:

Tunnel systems.....	10
Conduits formed from iron tubes or sections.....	10
Conduits formed from concrete, wood or masonry.....	20
Sidewalk or gutter systems.....	20
Permanently embedded wire systems.....	12
Cables and insulating compounds.....	12

Systems not capable of being classified under the foregoing heads mainly comprised of suggestions, alternative propositions and ideas incomplete in detail, with overhead combined systems making up the remainder.

The Commission have visited the cities of Chicago and Philadelphia and Brooklyn, and have heard full reports of the subway systems in use in Washington, Boston and Detroit, as well as in various cities in other countries—their extent and modes of construction.

The principal systems of electrical subways may be divided, first, as to their material composition, and second, as to their mechanical construction, and the manner in which the wires are placed in them.

As to material composition, subways are:

- 1st. Of insulating material, such as wood, glass, concrete, etc., etc.
- 2d. Of conducting material, such as iron.

As to mechanical construction, subways are, generally speaking:

- 1st. Tunnel systems.
- 2d. "Drawing-in" systems.
- 3d. Solid systems.
- 4th. "Dropping-in" systems.
- 5th. Combined systems.

Tunnel systems, or those where space is provided underground sufficient to allow the passage to and fro of men who place the wires within the subway, could be recommended, were unlimited time and money at the disposal of the Commission; but the expense of such a system and the crying need of immediate action, preclude the adoption of such a plan. If ever underground railroads become a feature of our city transportation, then, perhaps, the tunnel can be used for some of the future trunk line cables.

In Paris, where the foundations of the city are honeycombed in all directions by large sewers, such a plan is practicable and admirable, but not to be thought of in New York.

Drawing-in systems, or those where man-holes are provided in the streets, connected by tubes or pipes through which the wires can be drawn, are next in prominence and convenience to tunnel systems.

In Chicago there were seen in successful operation nearly twenty miles of conduits of the "drawing-in-and-out" pattern of various materials, containing all kinds of wires, as follows:

Eight miles of the Dorsett system of concrete conduit divided into ducts, and containing in the separate ducts wires of the city telephone, telegraph and fire service, electric light wires and wires of different telegraph companies.

Four miles of the Johnstone system of iron conduit divided by metal shelves, and carrying the wires of the Postal Telegraph Company.

One mile of 3-inch iron pipes, four in number, carrying the wires of the Western Union Telegraph Company.

Three miles of iron pipes, carrying the wires of the Bankers and Merchants' Telegraph Company.

In Philadelphia a comprehensive "drawing-in" system of iron was seen, containing electric light and telephone and telegraph wires.

In Boston some two miles of such "drawing-in" iron systems are in operation.

In London 9,000 miles of wire are underground, bunched into cables and drawn into 3-inch iron pipes.

Solid systems, or those where wires are permanently embedded in insulating material and incapable of being reached except by tearing up the streets and the insulation, have been found to work with more or less success. The Commissioners saw several miles of this conduit in successful operation in Chicago by the telephone company there, where wires were buried in an asphalt or coal-tar cement, laid in a wooden trough.

Several miles of similar conduit are in use in Washington for electric lighting, and there are other instances of the successful operation of this description of conduit.

In this City of New York there are several systems in use underground, each more or less satisfactory to those employing it.

A prominent example is the Brooks system used by the Metropolitan Telephone and Telegraph Company. It consists of an iron tube in which cotton-wrapped wires are drawn, and the tube filled with oil, the oil acting as an insulating medium. It is kept at a desired pressure—the tubes constantly full—by means of a stand-pipe. They use a two and a half inch iron pipe, and the system is cheap, costing less than \$11 per mile of wire, because into such a pipe they can draw 300 telephone wires. Wires for telephone purposes, and those used in the American District and other call boxes, are of a very light intensity, and do not need as heavy insulation as do all other kinds. This system is claimed to give perfect satisfaction for telephone conductors.

The Western Union Telegraph Company has many wires already down in this city laid in 3-inch iron pipes, into which they drew cables manufactured from okonite or kerite insulation. These pipes are lead-jointed, are laid in Broadway, and have man-holes occasionally for taking out the wire.

To sum up as to the form of subway and the manner in which the wires are to be placed in it:

I am convinced that from the standpoint of an electrician simply it may be said that almost any plan or system *can be made* to work; from a single lead-covered wire laid directly in the earth to a great tunnel upon whose walls the insulated conductors can be hung. Within certain broad limits, any system is electrically practicable; retardation and induction can be overcome. It is only when we face in this city the mechanical engineering and chemical questions of interference with water-pipes, gas-pipes and sewer-pipes, of obstructions from vaults, of danger from steam-pipes, of the action of sewer and illuminating gas, that the necessity for careful discrimination presents itself.

In the future, when the uses of electricity become more general, and its nature better known, it may be that the City of New York will absolutely require a grand electrical underground highway, where space can be provided for the conducting and distributing of sufficient power to run all the engines and work all the machinery within the city limits. It may be and probably will be, that before such space is needed, much more will be known of the qualities of different forms of electrical conductors, and of the best methods of carrying them underground, and that the matter of electrical subways will be no longer experimental, but practically demonstrated in every detail.

When such a time comes the Commission or other authority will determine what is required to meet the necessities of the occasion.

The responsibilities of the present Commission begin and end with providing for

the requirements of their own day, and for such of the exigencies of the future as they can reasonably anticipate.

Leaving out of consideration all tunnel systems as too expensive, we must also discard any system which calls for the simple laying of insulated cables in the earth. They would not stand the chemical action of the gases and acids; the streets would be continually torn up for new connections and repairs. We are thus shut up to the question of electric subways or conduits, in which the wires or cables, insulated or otherwise, must be placed, and which once laid down should meet all the demands of the present and near future.

Of conduits it may be safely predicted that, so far as the experience of this and other cities is a test, some form or other of a "drawing-in" system is most convenient. The life of the best cable is by no means satisfactorily decided, and, of any particular cable, to predict how long it would last would be purely speculative. Of wires not contained in cables it may be said that they are equally more uncertain in their length of life and usefulness. At all events for purposes of distribution it is desirable that the wires should be easily approached at frequent intervals and the Commission cannot countenance any plan that looks to the disturbance of pavements more than is absolutely necessary.

It may be that through lines of wire would be better protected laid in permanent beds of insulating material; but a "drawing-in" conduit system allows space to be provided for new wires without the frequent tearing up of pavements.

The Commission can, therefore, give their approval to a "drawing-in" system with frequent man-holes, as the general form of subway best adapted to meet the requirements of the electrical service of the present.

Passing now to the question of material, I will submit the opinion of a chemical expert whom I have employed to investigate this subject, together with such other opinions as I have been able to gather.

REPORT OF DR. ALBERT R. LEDOUX, AN EXPERT CHEMIST, AS TO THE MATERIAL FOR USE IN CONDUITS.

NEW YORK, June 29, 1886.

This problem divides itself naturally, as one examines the papers submitted to the Board, into two questions: Shall we use iron conduits, or those which are themselves non-conductors or insulators? I have given this matter the closest attention, and have arrived at the unqualified opinion that a *non-metallic material should be chosen*; not iron—for the following, among many other, reasons:

First.—Expense. Iron pipes or boxes cost more than any of the concrete or cement conduits presented to the Commission. A three-inch cast-iron pipe costs about 20 cents a foot, and can possibly be furnished on a very large scale for about 15 cents per foot. While tiling, board boxes, asphaltic mastics, cements and concretes can be made of the same capacity for from one-half to one-tenth of this cost.

Second.—The next question to cost is that of durability. The experience of all city engineers has proved conclusively that iron under ground is by no means as durable as iron simply exposed to atmospheric influences. Often pipes that have been

down some time, although retaining their shape, are found to be eaten through and through with rust, so that the slightest blow shatters them into fragments. Moreover, a very large area of this city under ground is exposed to the action of salt water. In a large number of streets, at a very short distance below the surface of the ground, the tide rises and falls, and in such localities iron is rapidly corroded.

Third.—Another objection to iron pipes (electrically) is this: In all the hundreds of miles of cables or single wires which must be strung in the conduits, whatever they may be covered with, there is certain to be more or less leakage of electricity, more or less abrasion and destruction of the insulating covering of the wires. Wherever such takes place within an iron pipe, the wire is at once grounded, as is the frequent experience of the telegraph companies now using iron pipes in this city. In addition, should the insulation be weakened upon a conductor carrying the current of an arc electric light, and should this wire thus exposed come in contact with an iron pipe carrying telephone wires, or even telegraph wires, not perfectly insulated, a destructive connection is possible, which might not only injure the smaller wires, but lead into every office or every house where the telephone or telegraph wires entered a current which is at once dangerous to life, and also liable to set fire to the structure.

Fourth.—Again, the great expansion and contraction of iron is a disadvantage, when filled with insulated wires; and

Fifth.—Again, the condensation of moisture within an iron conduit, unless a gutta percha insulation is used, is detrimental.

Sixth.—Again, an iron conduit cannot be sub-divided into separate ducts or chambers for different wires, without rapidly increasing the cost per foot, in a greater degree than when any other material is used.

Discarding iron for the reasons above stated, we have to choose between conduits of wood, cement, tiling, solid asphalt and asphaltic concrete.

The Brooklyn Commission, upon which are two eminent experts, finding that with a well insulated cable any conduit can be made to work, after careful consideration did not choose iron, but first authorized a simple box trench of creosoted wood, and have made no effort to make it either gas or water tight. The result has been, to quote from their last report (see p. 6, Second Report of Brooklyn Commission) the following:

"In its former report the Board mentioned the fact that a conduit of creosoted wood has been successfully operated (with telephone wires alone) in Brooklyn for nine months previously. This conduit has since been opened and examined, and is still in service, thus giving an aggregate test of sixteen months' trial. Nothing was discovered by the examination above mentioned which was unfavorable to the creosoted wood as material for the conduit. But it was found that in some places the lead casing of the cables had been seriously corroded (carbonated) by carbonic acid, probably contained in the 'water gas'—illuminating gas—which had leaked into the conduit. This corrosion would apparently have destroyed the lead casing, at the points where the action was most destructive, in about eighteen months."

In fact, under the influence of dampness and steam heat, such a box becomes in time little else than a blind drain into which will percolate and stagnate more or less of the organic matter of the soil, even if ventilation prevents the accumulation of gas.

The experience of the Commercial Cable Company in this city also shows the

very strong corrosive action of gas on a lead covering unprotected by an outer impervious shield.

The experience with solid conduits is claimed to be satisfactory in Chicago and Washington. When once a wire or cable so bedded becomes imperfect, it must be abandoned and can never be replaced without digging up the whole bed. And no new wires or cables can be introduced when needed without laying a new bed or reopening the streets, or the owner must insert, once and for all, the whole number of conductors he thinks he may need at any future time, and thus incur a great and unnecessary outlay of capital.

The laborer's pick has been one of the great objections to any cement or tiling system, and it is now nowhere seriously considered.

To conclude this branch of the subject, after hearing all arguments and careful consideration, I give my unqualified approval to an asphalt concrete conduit, *provided it can be made of sufficient strength and durability, can resist the action of acids, alkalis and gases, and can be made gas and water tight*, and be in itself an insulator. As I am writing for your personal information and not for the public, I will frankly state that I have been led to this conclusion reluctantly, against my preconceived ideas, and solely by my tests, after consulting the best *disinterested* available authorities in this country. I had, until I began this investigation, the idea that an iron pipe, because now most largely used to hold a simple cable, would, enlarged, be the best form and material for a conduit.

For your guidance I will give here some of the opinions I have obtained:

Mr. R. W. Hope, editor of the *Electrical Engineer*, who appeared before the New York Commission at its request, said:

"From an electrical point of view, there can be no doubt that a conduit should be made an insulator. In placing wires inside a conduit of which the material is an insulator, you will have them nearer to the present overhead conditions than in any other way. If iron were used, you would simply bring the wires into closer contact with the earth, which is acknowledged to be a disadvantage. This disadvantage might, of course, be reduced by a metallic shield, but that would not by any means overcome it. It is an accepted proposition that wires, to be placed underground, should be well insulated, and being so insulated, it is to their advantage to be placed in a non-conducting material; because if any injury should happen to the insulation of the wires, they would still be protected by the insulating material in the conduit, and so would not come into immediate contact with the earth, as they would if in an iron conduit.

"I speak from many years' study and experience of this question, and am satisfied that whether for wires having metallic shields or for other forms of insulation, a conduit of an insulating material is preferable. I am certainly in favor of such a conduit made of an insulation material."

Mr. J. P. Davis, vice-president of the Metropolitan Telephone and Telegraph Company, said:

"I indorse what Mr. Pope has stated, that a conduit should be made of an insulating material. When I first gave attention to this matter, I wanted to adopt a glass tube in cement concrete, but found we could not do it satisfactorily. I have no doubt that, as far as telephone wires are concerned, it would be better to have them in an insulating material.

"There might be raised two objections to this material—the first as to its durability. I have looked into that question very closely for a year, and am satisfied on that point. Our tests are perfectly satisfactory to us.

"The other is as to the effect of heat upon it, and I have no doubt there is some danger there, but it is a danger that can be guarded against where there is any liability of its coming in contact with steam pipes.

"Further, I don't think the radiation of heat from the pipes is going to be sufficient to cause injury. I think a plank covering would be sufficient."

Mr. R. W. Pope said further:

"Wires covered with gutta percha and drawn into the Western Union pipes, which are of iron, are affected by heat. Iron being a conductor of heat, the wires were injured in their insulation. This material being a non-conductor of heat, though it might be affected on its outer surface, would not carry the heat to the wires inside."

Mr. J. P. Davis said:

"I have no doubt the material can be protected from steam heat.

"As regards an iron conduit, I had three years' experience with one in Boston. The longest line was about 1,500 feet, and the moment the wires were put into use the subscribers complained and protested they could not hear. This was caused by retardation. They could not get their voices through. (Probably using the earth as a return circuit, not a metallic circuit. A. R. L.). A greater conductivity in the wires would not remedy this. You could use a much longer line in a conduit that is an insulator than in one that is a conductor.

"No amount of insulating material around the wire could make it work as well in an iron as in an insulated conduit.

"The question of retardation is a very serious one, and the use of iron is undoubtedly a great disadvantage in that respect. The fact is, there is no material that can be put underground that will resist the dangers to be found there as well as one made from the ingredients used in an asphalt conduit."

In addition to these expert opinions, I have obtained many others, and my own observation leads me to remark:

First.—In a non-conducting conduit the wires of different service are not only protected against grounding, but also against crossing or short circuiting. The very slightest electrical disturbance prohibits almost entirely communication by telephone. De La Rue has shown "that the strength of the electrical current produced by an ordinary telephone in use as a transmitter, is less than that which would be generated by a single battery cell, through a line of ordinary telegraph wire six million miles in length, and the strongest current produced by such a telephone is only 400-thousandths as strong as that used on a telegraph line; while a current one-millionth as strong as the ordinary telegraph current will give distinct audible articulation."

This being the fact, you can readily see how important it is that the telephone wire, at least, should be separated not by iron, but by thoroughly insulating material from stronger currents. The greater question of induction most serious of all electrically in a non-conducting telephone conduit can be, and has been, readily remedied by "anti-induction" cables, metal shields, coupling in metallic circuits, etc., etc., while

retardation no device can entirely overcome in wires buried in an iron conduit, even if the sectional area of the conductor is largely increased.

Another advantage in an asphaltic concrete is the readiness with which the shape of a conduit can be altered to suit any locality, the ease of repair and the durability under the conditions of our streets in New York. As to this latter point, I beg to submit the following copy of a report on asphalt concrete, made at the request of the Commissioner of Public Works:

DEPARTMENT OF PUBLIC WORKS,

COMMISSIONER'S OFFICE,

No. 31 Chambers street.

NEW YORK, February 1, 1886.

To the Commissioner of Public Works

SIR—The questions you request me to answer are as follows:

First.—The life and probable durability of a cement or concrete structure, principally of compounds of asphaltum, when laid under the streets of New York, subjected to the influences of gases and steam-heating pipes.

Second.—Its strength to resist strain.

Third.—The effect of frost.

Fourth.—Its life as compared to cast iron.

To these inquiries I reply in the order of their tabulation, but with the express qualifications that the scope and exactness of my answers is limited, owing to the omission of the purpose for which the said "structure" is intended; also that the first question is misleading—doubtless inadvertently so—in that there is no concrete used for structural purposes, so far as I am aware or am able to ascertain, of which the chief component part is "*principally* of compounds of asphaltum," that is, if the term "principally" is meant to express relative mass or bulk. I shall, therefore, assume an intended purpose for the said "structure" analogous to that of drain pipes, sewers or vault work, and also that the material is that usually known to engineers as mastic or asphaltum, and its compounds, concrete. The term "asphaltum and its compounds" has become somewhat elastic and inclusive term, in that under it are also frequently classed any or all of the residuums of the distillation of petroleum. But without further amplification, I respectfully submit as follows:

First.—That the life and probable durability of an asphaltum and its components—concrete—"structure" made to best modern specification and patents, is imperishable under the conditions named, as far as my knowledge extends, provided that the heat of steam pipes is not sufficient to melt the structure.

There are but few conditions in practice, however, where this contingency—namely, destruction by heat—could arise, as a properly compounded asphaltum concrete would be acted upon very slowly by radiant heat, certainly requiring at least 212 to render it plastic.

Second.—The strength to resist strain of the best compounded asphaltum concretes may be calculated at the following maximums:

Crushing load, 4,000 lbs. per square inch of section.

Tensile strength, 350 lbs. per square inch of section.

This would seem to indicate ample transverse strength.

Third.—As the best asphaltum concrete is impervious to moisture and is practically incapable of contraction and expansion, frost could, therefore, have no direct or appreciable effect upon it.

Fourth.—As to its life underground compared to "cast iron." As a matter of fact, *the most widely used and generally successful process of treating iron pipes for underground duty consists in thoroughly coating them with asphaltum.* Without such protection, iron under ground rapidly deteriorates in some cases, much depending, however, on the conditions and locality.

I would add, that the results set forth can only be reached by rigid adherence to details, both in the material and manufacture of the concrete. For instance, I should regard it as essential, among others, that the specification for material and construction should require the use of very sharp sand, thoroughly cleansed and heated to at least 250 degrees before and at the time of mixture; that the bitumen should have the light oils distilled at a high temperature; that the blocks or shells of the structure should be thoroughly tamped during the moulding process, and that there should be sufficient compound mastic used to fill all voids or interstices, thereby forming the bond or union to solidify the mass. So formed, so far as disintegration is concerned, there is probably no more durable material used in engineering.

Yours respectfully,

G. W. BIRDSALL,

Chief Engineer, Croton Aqueduct.

EXPERIMENTS.

After arriving at the conclusions that the best material for the conduits is an asphaltic or equivalent concrete, I then determined to make with such a concrete a series of tests to ascertain whether it could be made to stand the ordeal through which a conduit should pass to overcome all the subterranean influences prevalent in this city. A theoretically perfect concrete is one in which the cementing body is in just the proper proportion to exactly fill up when cold the interstices in the sand or gravel which forms the base. It should resist the action of sewer and illuminating gas; it should sustain a crushing strain of 4,000 pounds per square inch, so as to support any possible weight when in position; it should be gas and water tight; not attacked by acids; uninjured by salt water; not liable to expansion or contraction; and be able either to stand the heat from steam pipes *in the severest condition* in which it may be necessary to place it, or else be susceptible of being easily and cheaply protected from heat effects that cannot be avoided.

I have had considerable experience with asphalt materials of all kinds, and the proper tests to make easily suggested themselves. I obtained several lengths of such material, and made the following analysis:

ANALYSIS.

The sample contains:

Organic and volatile matter.....	27.72
Sand and other mineral matter.....	72.28
	<hr/>
	100.00

The organic matter contains:

Oils	5.86%
Pitch	21.86
	<hr/>
	27.72

The mineral matter contains a small amount of metallic oxides.

The following experiments were made:

A sample was placed in a bottle kept at 75 degrees, through which a steady current of street gas was passed for a week; at the end of that time there was not the slightest effect visible.

Another sample was suspended in salt water kept at a temperature of 100 degrees F., with no apparent effect.

A portion of the conduit was then suspended in water with a thermometer alongside of it and the temperature raised; at 150 degrees it began to soften, but this was only upon the outside where in contact with the water. The material is a good non-conductor of heat, and therefore at 150 degrees the effect is only superficial. At 210 degrees the whole mass was soft enough to be indented and pressed out of shape, while heated up to 250 degrees it was disintegrated.

I therefore determined to make another and more thorough heat test; one which would answer the question as to the probable effect of steam pipes in the streets on an asphalt conduit: First, as to the effect of the heat under the severest possible test that could approximate to the most rigorous conditions that could be exacted in practice; and, second, to see what remedy could be applied, if necessary to lay the conduits near a steam pipe.

I therefore had a ditch made in the earth two feet wide, three feet deep and thirty feet in length. In this I laid a 4-inch steam pipe, connected with a pair of 80 horsepower boilers, coupled. The length of pipe from the boilers to the ditch was fifty feet, while a valve upon the further end of the pipe allowed the escape of steam and the outflow of all condensed water. In this ditch I laid three lengths of conduit, as follows: One nine inches from the steam pipe, one six inches, and another three and one-half inches; between the last conduit and the pipe I stood an inch plank, and then filled the trench with sand.

Opposite each section, between it and the steam pipe, I inserted self-registering maximum, and other standard thermometers; steam was turned on at a pressure of 90 lbs., and a steady pressure was maintained, not going below this point for seven hours. At the end of this time steam was turned off, the conduits examined and the temperature noted. The maxima were as follows:

9 inches from steam pipe.....	96° F.
6 " " " "	104° F.
3 " " " "	134° F.
1 " " " "	190° F.
2 " " " "	} 92° F.
but protected by a board.....	

You will at once observe that during this length of time at no point was the temperature outside of the pipe high enough to affect the conduit, notwithstanding the fact that the pressure of 90 lbs. in the pipe is equivalent to 324 degrees F. A single inch of intervening earth (sand) was a sufficient protector; while a plank, or coating of mineral wool, would seem all-sufficient for the most extraordinary circumstances imaginable. I must confess that I was surprised at the non-conducting power of the sand. [Near the pipe, with no sand between, the temperature was 260 degrees.]

I am aware that the presence of moisture, the distance from the surface, etc., would materially affect the radiation and conductivity of the sand, and I therefore made the following experiment to prove absolutely the degree of heat:

I surrounded the 4-inch pipe with a board casing 18 inches in diameter, through the centre of which passed the pipe. This was filled with sand previously made absolutely dry, and the pressure maintained at 90 lbs. The maximum temperature reached in this box at a distance of 7 inches from the pipes was 97 degrees F. during a *six* hours' test. These results, I confess, greatly surprised me, but I give them as I found them.

To determine the protection afforded by mineral wool, I wrapped a half-inch iron pipe in a half-inch coating of this material, and inserted it through a 2½-inch conduit duct. Not the slightest effect was produced by steam at a temperature of 290 degrees when passed through this pipe for six hours. I also laid a piece of the concrete upon a bed of mineral wool three-fourths-inch thick, and allowed the flame of a Bunsen burner to come near the bottom of the mineral wool. The asphalt was not even softened in an hour's time.

It is therefore absurd to predict any danger from steam pipes to any such conduit, unless the pipes burst or are in actual contact. In these cases, the iron conduits would be equally unsatisfactory, as being such good conductors of heat, the insulation of the conductors would be destroyed.

CONCLUSION.

AS TO MATERIAL.

After a careful examination of the plans submitted to me, and after considering all the facts stated herein, I recommend an asphaltic concrete; but I also recommend the most *rigid* testing and *inspection* of the conduit while being manufactured and laid, and the exacting of guarantees from the manufacturers that their work will stand certain tests.

They should sustain a crushing strength of not less than 4,500 pounds per square inch. It should not soften materially below 160 degrees F. It should be made of the best materials and in the best manner. During the laying a rigid inspection should be maintained.

INSULATION.

In a certain sense the Commission can afford to be liberal in allowing the electric companies to use any kind of insulated conductors they prefer, but certain rules should be laid down that will insure the exclusion of untried and experimental compounds, which, should they fail, will cause the frequent reopening of conduits and cause inconvenience and trouble.

With honest inspection and full power to modify any plan adopted, and to make it conform to the exigencies which may arise, I see no trouble in obtaining a speedy compliance with the law, and one that will be satisfactory to all parties and a credit to our city. Many of the plans and devices before the Commission will be found of great value when the work of laying the wires commences, and new, and possibly unexpected, problems are presented to your supervising experts.

Very respectfully submitted,

ALBERT R. LEDOUX, M. S., Ph. D.

In addition to the above I will submit the following report of a general committee of the different electrical companies, furnished and vouched for by President Morton, of Stevens Institute, Hoboken, to the same effect, namely, that insulating materials are preferable for conduit purposes to iron tubes. This conclusion they reached after nearly a year of study and investigation.

THE GENERAL COMMITTEE
ON UNDERGROUND COMMUNICATION,

115 Broadway, Room 47,

NEW YORK, March 15, 1884.

To the Committee on Business Organization:

GENTLEMEN—In pursuance of the instructions received by this committee on the seventh day of May, 1883, we beg to report:

About six hundred patents and plans relating to systems of underground electrical communication have been carefully examined.

In the search for a practicable system consideration must first be given to the numerous plans, arrangements or constructions which have for their object the avoidance or elimination of the disturbance due to induction.

* * * * *

As regards a conduit, the principal requirements are that it be cheap, water-tight, have sufficient capacity, permit (without disturbing the pavement) the insertion, removal and addition of wires, and allow access for repairs and testing.

The material for, and construction of, a conduit are, in a measure, determined by the particular system of conductors it is to carry.

For an inclusive system iron is objectionable. The light conductors require to be widely separated from each other, from all other classes of conductors and from the walls of the conduit. An iron pipe of large diameter would be required, involving great expense. Another objection to iron is that much of the current energy would be uselessly expended in setting up induced currents in the iron pipe. A third objection lies in the difficulty of securing tight joints, due to its large coefficient of expansion. A fourth pertains to its destructibility.

Various other materials have been suggested for an underground conduit—wood creosoted or coated with paraffine or asphalt, glass, porcelain, earthenware coated with asphalt, stoneware, artificial stone, glazed terra-cotta, asphalt-coated terra-cotta,

paper saturated with asphalt, and various compositions, such as marble dust and asphalt; sand, linseed oil and asphalt; sand, broken stone and asphalt; sulphur, sesquioxide of iron and bitumen; sand, paraffine, asphalt, with the addition of certain chemicals, etc., etc.

As far as durability is concerned, wood, properly treated, is known to last underground a great many years and could be used in the construction of a conduit. Creosoted wood is, however, injurious to gutta-percha-covered wires. Earthenware or terra-cotta pipes have been used in England, and if glazed or coated with asphalt and well jointed to exclude moisture, could be used for underground service. Glass and porcelain are expensive materials. Asphalt-saturated paper could be used for the lining of passages in some forms of underground conduit. Artificial stone molded into a continuous conduit is cheap, and one of this kind was laid in 1881, in Market street, Philadelphia. In this conduit tin tubes covered with asphalt are imbedded in the artificial stone.

Terra-cotta thoroughly coated with asphalt is a cheap material, and when protected by an outer box or covering of creosoted wood is adapted for an underground conduit of the usual form. It is unaffected by changes of temperature, there is little or no difficulty in securing and maintaining tight joints, and if properly coated with asphaltum it is indestructible. As regards the compositions before referred to, the last named, consisting of asphalt, sand, paraffine, etc., is stated to be a good insulator and impervious to moisture, as well as strong and durable.

Respectfully submitted,

SUB-COMMITTEE ON ELECTRICAL
AND MECHANICAL DEVICES.

In addition, I will submit the report of Mr. John Thompson, the Commission's expert, in reference to the material to be used in conduits.

FIFTH.

Special Observations with Respect to Material.

Electrically considered, the first pair of propositions which present themselves are: Shall we endeavor to place the electric conductors in the most intimate contact with earth; or, contrariwise, shall we stimulate so far as practicable the existing conditions above the surface? Upon this subject there seems to be as wide a difference of opinion between the doctors of electricity as the doctors of medicine.

Shall it be *contraria* or *similia*? Under each phantom subjects have died and have recovered.

If this question devolved upon the possibility, can the electric conductors under any circumstances be made to work, then there would be no controversy, for certainly they can. But in that it is apprehended the question is: How best will they operate? The answer unhesitatingly is given that an insulated conduit is best calculated to give general satisfaction, and for the following reasons among others:

Asphaltum concrete is a good non-conductor of electricity. It has practically no co-efficient of expansion. It is a good non-conductor of heat and very slowly acted upon thereby. It is cheap to manufacture. Strong, elastic, durable and generally

adapted for the purpose. Hence, the wires or cables would not require to be so heavily insulated or widely separated, nor would there be liability to admit gas or moisture due to separation of joints by expansion or contraction. In the instance of the telephone wires, as effected by retardation, it offers the one fundamental remedy known for this most serious difficulty, namely, separation from earth.

Iron is an excellent conductor of electricity. It has a high co-efficient of expansion. It is an excellent conductor of heat. It, therefore, would only afford mechanical protection to the wires or cables, and in view of the area of ground contact afforded each wire or cable would thereby be brought into far more intimate electrical relations with earth than if each of said wires or cables were separately buried therein. This has been presented as an advantage in that induced currents would thereby be dissipated. But it is apprehended that this would tend to set up induced currents where they would otherwise not exist, and, therefore, be simply a useless waste of energy, and to that extent *increasing* the nominal retarding effect due to earth contact.

Nor has it been seriously proposed to attempt to form continuous ducts in an iron conduit without break. Such is impracticable unless a separate pipe be laid for each cable. And as it has been demonstrated in practice that but one cable can be advantageously handled in each duct, this fault is in itself a serious objection.

In support of this view of the case a few authorities and illustrations may be cited.

The Joint Committee on Underground Communication reported on December 5, 1883, that "for an inclusive system, iron is objectionable."

The underground cables of Germany are laid in a trench filled with bitumen.

The underground wires of England are bunched in iron pipes; but it has been reported the telephone service so attempted has not been successful.

The Bell Telephone Company put cables through iron pipes in Boston; but their engineer, Mr. Davis, has stated before this Board that the retardation was so great as to cause serious dissatisfaction among their patrons, though the extent of buried wires was limited.

Mr. Frank L. Pope, the electrical expert, endorsed a system presented to you, consisting of heavy glass tubes encased with iron.

Mr. Ralph W. Pope, editor of the *Electrical Engineer*, testified before you his preference for an insulated conduit.

The cables laid about a year ago in Brooklyn, in a comparatively open ditch, formed by creosoted wood, has already proved to an extent unworthy, and concrete conduits are now being laid.

As opposed to this, but one prominent authority has taken a contending view before you, namely, Mr. T. A. Edison, who asserts that any or all wires can be made to operate successfully even when bunched promiscuously in one common iron pipe. So being, then so much the better. But while experience is not infallible as a guide to truth, it is yet fair to submit whether or not it would be wise or expedient for you to take the initiative in the adoption of a scheme generally opposed by experienced authority.

As to the term "asphaltum concrete," it is of elastic proportions, and may require

to be defined. In the estimate of the writer but two elements are of controlling importance, namely, honest material and honest workmanship. The bitumen ought to be distilled at a moderately high temperature, sufficient to drive off the lighter oils, and yet not great enough to char or burn the residuum. The sand (silicious) should be perfectly clean, very sharp, of small grain, and heated to at least 220 degrees before and at the time of mixture.

These simple elements, first thoroughly commingled, and then tamped during the molding process, forms a mass than which there is probably none more durable known to engineering, impervious alike to moisture, gases and acids.

As to the strength of the structure:

Much consideration has been given to this aspect of the case, in view of the proximity to the street surface, which it is desired to lay the conduit.

From the data on this subject, it is safe to say that asphaltum concrete can be uniformly produced offering a minimum crushing resistance equal to 4,500 pounds per square inch and an ultimate tensile strength equal to 325 pounds per square inch of section. This would indicate ample transverse strength, particularly when it is considered that the top and bottom of the conduits are proposed to be reinforced by concrete, so that the entire mass would virtually be a monolith extending from junction-box to junction-box.

It may be stated that asphaltum concrete, in consequence of its resilient property, has been used with complete satisfaction as a foundation for steam and drop hammers, and analogous situations subjected to heavy and continued impacts.

SIXTH.

Respecting patents: This aspect of the problem has been regarded with considerable apprehension; for it may be considered as practically certain that, whatever be the system put down, patent litigation will be likely to follow. This opinion is based upon the fact that while underground systems for conveying electric conductors are comparatively new, there has yet been a very considerable number of patents granted thereon, covering a wide range of plans, processes and manufacturing appliances. Nevertheless, "the state of the art," and the validity of what may be regarded as generic patents, have not yet been defined by the Courts. No attempt has been made to act upon this subject as, were it properly passed upon it would require an extended and painstaking search, involving considerable expense, and at the best the result thereof would be but an opinion, with which the Courts after all might not agree. And yet this is a feature of great importance which may not be disregarded.

SEVENTH AND FINALLY.

A few suggestions as to supervision and rules would seem to be in order:

1. The company who may build the conduit should at once prepare and submit a working plan of such section of the city as you may select for immediate operations.
2. The survey should give the exact condition of the street or streets, and the number and kind of conductors in use.
3. All matters of detail, either as pertains to the conduit, the entrenchment, or the management thereof, to be subject to your approval.

4. It should be provided that no cable be drawn into the conduit of greater length or diameter than would enable the Conduit Company to handle it easily.

5. All wires entering the conduit from sources above ground should be provided with approved lightning arrestors to prevent damages to their insulation by atmospheric electricity.

6. The Conduit Company should have absolute control of all running wires, repairs, connections, changes of every kind and character, thus enabling them to keep track by means of maps and otherwise of the locations and positions of all wires, branch connections, etc., etc., and thus prevent and be responsible for any interference between competitive companies.

7. The conduit company should be responsible for all damages done to cables of the different companies by reason of their neglect of other work.

8. As to any or all patents owned or controlled by the conduit company, as well as any or all patents not owned by said company, it should assume all risks of possible patent interference, and litigation as against the city, the electric companies and the Commission, and should file a bond of indemnity sufficient to assure such risk.

9. The Commission ought also to reserve the right to make such modifications and changes as may occur in the future due to the experience acquired in the accomplishment of the work and more extended and mature deliberation.

The foregoing is respectfully submitted and subscribed to as representing the most advanced principles as proved in the judgment of the writer by preponderance of evidence and opinion.

WHILE IT APPEARS, THEREFORE:

1st.—That any kind of conduit which will protect the insulated wires will answer, and on the other hand,

2d.—That no known conduit has yet been found which works perfectly, or is an ideal one. It may be said with confidence that the weight of evidence before the Commission is toward the use of an insulating material for conduits, and of insulating materials, asphalt or bituminous concrete has certain advantage over all others, viz.:

1st.—It is cheap.

2d.—It is durable.

3d.—It is capable of standing harsh treatment.

4th.—It can be easily and closely jointed.

5th.—It can be made absolutely free from moisture, and free from contraction and expansion.

6th.—It is a bad conductor of heat as well as of electricity.

Finally, in using asphalt or bituminous concretes for the main material of the subway the Commission can also provide metallic induction shields or special insulation for such companies as desire, and may readily make ducts conformable to special exigencies, while preserving the principle of extra insulation in the material of the conduit intact. A conduit is nothing more electrically and mechanically than a protection for the wires within it, and a convenience for placing them underground.

It is the part of the Commission to secure to the best of their information and belief the best and most convenient protection for the wires, and it is believed that this can be secured in an asphalt concrete "drawing-in-and-out" conduit, and that in the material decided upon all the advantages known to exist in any system can be successfully combined.

But in the same way as it has been said that for particular purposes or particular localities, it may be necessary for the Commission to depart from the drawing-in system, so it may be said that it may be necessary for them at times to depart from the asphalt concrete material.

Iron pipes have two distinct advantages over the asphalt concrete which are indisputable. They are stronger and they are less bulky. If for special reasons extraordinary strength or compactness is preferable at special points to durability and insulating properties and cheapness, then the Commission can at those points be compelled to modify their plan to suit the exigencies of the case and use iron.

Again, there are cases where it could be foolishness for the Commission not to take advantage of certain circumstances which render a modification of their plan reasonable, as for instance where cable surface roads or underground roads are in process of construction, and where for an outlay much less than that required to lay any kind of conduit, the Commission can secure a space admirably adapted to their wants.

In general we may conclude that while we approve the *asphalt concrete drawing-in system*, other things being equal, each particular specification of the Commission will have to be governed by the circumstances of the case for which it provides.

Commissioner Flower offered the following:

I.

Resolved, That the Commission, in view of all the information they have been able to acquire on the subject, favor a subway which shall in the main conform to the following requirements:

1st.—Its material shall be an asphalt or bituminous concrete which shall be capable of sustaining the following tests: Strength—It should sustain a crushing test of 4,000 pounds per square inch, and have a tensile strength of not less than 300 pounds per square inch of section. Resistance to heat and cold—It should not crack when subjected to temperature of—10 degrees, nor lose its shape at 200 degrees. It should not soften below 160 degrees. Other physical properties—It should resist the action of organic acids and illuminating gas, and should not disintegrate under the action of salt water. Materials—The pitch or asphalt used should be inspected before it enters into the concrete, and be pliable at 150 degrees, but brittle below that temperature. It should not be heated above 325 degrees in boiling. The sand used should be silicious, and the porosity of each lot carefully determined, so as to insure the perfect cohesion of the mass—with no excess of plastic material. But this shall not prevent the use of any other material where the special exigencies of particular electrical service or of particular localities render it advisable in the opinion of the Commission.

2d.—Its form shall in general be that of a conduit with convenient manholes where cables and insulated wires may be readily drawn in and out of distinct ducts in the conduit; but this shall not prevent the laying of wires in other ways where for special reasons it may seem desirable to the Commission.

II.

That the Commission may be better informed as to the necessary details of their supposed general plan,

Resolved, That Mr. Thomson, the mechanical expert of the Commission, be called upon to report at the next meeting of the Commission such data as he has collected as to

1st.—The elaboration of the plan necessary in providing for different classes of wires; and

2d.—The mode of distribution best adapted to the wires of different electrical service.

And Resolved, That the engineer of the Commission be called upon to report at the next meeting of the Commission such data as he has collected as to

1st.—The capacity of conduit required for different classes of wires in different parts of the city; and

2d.—The order in which different parts of the city can be most conveniently supplied with subways.

III.

Whereas, The Commission have no funds and there are no means at present existing by which such funds can be raised by the Commission, and whereas it is important that the placing of wires underground shall begin at the earliest moment possible, and whereas the Commission are advised by the Attorney-General of the State that they may properly engage with a construction company for the performance of this work.

Resolved, That the counsel of the Commission be called upon to report at the next meeting of the Commission generally as to a company to lay, operate and maintain the subway under the direction and control of the Commission—and to suggest to the Commission all necessary legal precautions and safeguards in the government of such company, with a general plan of contract to be made by the Commission with such company—which plan, before it is adopted by the Commission in any form, shall be submitted to the Attorney-General for his official criticism.

Question put that these resolutions be adopted. Agreed to unanimously.

Commissioner Hess moved the following resolution, which was agreed to unanimously:

IV.

That Henry S. Kearney be appointed Associate Supervising Engineer of this Commission, and that all papers relating to the locality of wires in this city, and the number in each locality, be referred to him for his assistance in preparing the report called for by previous resolutions.

Commissioner Flower offered the following, which was agreed to unanimously:

V.

Resolved, That Daniel L. Gibbens be retained as counsel of this Commission, and that all papers relating to the powers and duties of the Commission and all proposals for the construction of subways under the direction of the Commission be referred to him for his assistance in preparing the report called for by previous resolution. Compensation to be determined hereafter.

On motion of Commissioner Moss, Board adjourned until Tuesday, July 13, 1886, at 3.30 p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at No. 543 Madison avenue, on Tuesday, July 13, 1886. Present: Commissioners Flower, Hess and Moss.

The minutes of the previous meeting were read and approved.

Attention having been called to the application of the Edison Electric Illuminating Company for permission to place electric conductors underground between 23rd street and 59th street and Third and Eighth avenues, it was moved and carried that Commissioner Hess be appointed a committee of one to confer with the Edison Company with regard to their willingness to conform to the general plan of the Commission, and to report.

Mr. John Thomson read and submitted his report as called for by resolution.

Mr. H. S. Kearney submitted his report.

Mr. D. L. Gibbens, counsel, also submitted his report.

Commissioner Flower offered the following resolutions:

I.

Resolved, That the reports made this day by the engineers and counsel of this

Commission be laid upon the table for reference in providing for the details of the plan of the Commission as they are required to be provided for.

Agreed to unanimously.

II.

Resolved, That all currents of great intensity should be separated from all other currents, and that conductors of power and those used in arc lighting should be placed wherever practical in a conduit by themselves, subject to such regulations as may from time to time seem advisable to the Commission.

Agreed to unanimously.

III.

Resolved, That currents of light intensity should be separated from all other currents, and that telegraph, telephone, ticker, messenger and fire call wires and all those of that class may, wherever practical, be placed together in the same conduit, subject to such regulations as may from time to time seem advisable to the Commission.

Agreed to unanimously.

IV.

Resolved, That incandescent lighting wires should be provided for separately from all other wires and be placed, wherever practical, in a conduit by themselves, subject to such regulations as may from time to time seem advisable to the Commission.

Agreed to unanimously.

V.

Resolved, That the Commission hereby invite all companies and persons in the City of New York using electrical conductors to submit estimates of the number and kind of conductors they will respectively require in an underground system in the several streets and highways of the city, and as to all other matters relating to their respective service to submit such practical suggestions as to the elaboration of the general plan of the Commission not at variance with said general plan as they may desire to submit for the information and consideration of the Commission; the same to be submitted within ten days from the receipt by said companies of copies of this resolution, which the Secretary is hereby requested and directed to communicate to them without delay.

Agreed to unanimously.

VI.

Resolved, That the plan of contract submitted to the Commission for their approval by the counsel of the Commission, and which their counsel has advised them will be approved by the Attorney-General of the State, be, and the same is hereby made, subject to such approval by the Attorney-General, the contract which the Commission is ready and desirous to make with any properly organized corporation which

may be willing to sign said agreement to act as agent of the Commission for the laying, maintaining and operating of the subway.

Agreed to unanimously.

VII.

Resolved, That whereas several propositions have been made and others will undoubtedly be made to this Commission by parties desirous of acting as agents of the Commission in the performance of this work, and, whereas, it is proper for the Commission to provide for a consideration of all such propositions to the end that they may be informed as to which of the parties making such propositions is best able to carry out the said work to furnish sufficient security for the carrying out of the proposed contract, all such propositions, together with all such as shall be made to the Commission previous to their next meeting, shall be referred to the counsel of the Commission, who shall report at said next meeting as to such proposals, and which of said proposals is, in his opinion, the best for the Commission to accept, with the reasons therefor.

Agreed to unanimously.

VIII.

Resolved, That the counsel of the Commission be authorized to obtain the official approval of the Attorney-General of the contract submitted to the Commission in which the Attorney-General has signified his intention to so approve it.

Agreed to unanimously.

IX.

Resolved, That the engineers of the Commission be directed to continue their investigation of the manner in which the plan of the Commission should be elaborated for each of the separate services and localities of the city, and to report such facts and data as they may collect from time to time generally.

Agreed to unanimously.

X.

Resolved, That the engineers of the Commission be directed to submit as soon as possible accurate specifications proper to be furnished to such construction company as may become the agent of the Commission for the carrying out of the work, of the length, size, capacity, etc., of an asphalt drawing-in-and-out conduit to carry all the telegraph, telephone, etc., wires required in the localities and districts of the city where the Commission have decided to begin the work of construction of subways, viz.: from 23rd street to 59th street, from river to river, and also on 125th street, river to river.

Agreed to unanimously.

Board adjourned until Friday, July 16, 1886, at 3.30 p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at No. 1218 Broadway, on Friday, July 16, 1886. Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

Application read from Holmes Electric Protective Company for permission to erect three poles for the purpose of patrol signal boxes.

Moved by Commissioner Moss that said application be declined. Carried.

Mr. D. L. Gibbens, counsel, submitted the contract adopted at last meeting and the Attorney-General's indorsement and approval of same.

Mr. Gibbens likewise submitted a letter from the Attorney-General calling attention to his opinion that the law under which the Commission is acting does not make any provision for the collection of rental for the space in any subway occupied by electrical companies.

Counsel advised that this was covered by the contract to be entered into by a construction company, and that the Commission accepted no responsibility in the matter.

Mr. Gibbens submitted proposals to build, maintain and operate the subways in accordance with the plans and specifications of the Commission from the following: The New York Electric Lines Company, Sidney F. Shelbourne, president; D. H. Dorsett & Co.; Averill Insulating Conduit Company, M. T. McMahon, president; North American Telegraph and Electric Company, Lewis May, president; Consolidated Telegraph and Electrical Subway Company, Henry Fitzhugh, president.

Mr. Gibbens reported the result of his inquiries into the standing and ability of the above named companies, and placed the propositions in the following order of merit:

1. Consolidated Tel. & Elec. Subway Co.
2. Averill Insulating Conduit Company.
3. D. H. Dorsett & Co.
4. New York Electric Lines Company.
5. N. American Tel. & Elec. Subway Co.

Commissioner Moss offered the following resolution:

Resolved, That the Commission hereby accept the proposal of the Consolidated Telegraph and Electrical Subway Company, provided:

1st.—That the said company present to the Commission an indemnity bond of \$500,000, with sureties to the satisfaction of the Commission.

2d.—That said company present to the Commission such papers as they have covering the patents under which they claim they can do business and they are satisfactory.

3d.—That said company furnish accurate and satisfactory information as to the

time at which they will be ready to begin work and the rapidity with which they can carry it on.

4th.—That said company express specifically to the Commission their willingness to sign the contract prepared by the Commission and approved by the Attorney-General.

Seconded by Commissioner Hess and carried unanimously.

Commissioner Hess presented the Edison Company's suggestion with regard to their conforming to the general plan, and it was referred to the counsel.

Board adjourned until Tuesday, July 20, 1886, at 3.30 p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Tuesday, July 20, 1886. Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

Application read from W. C. Humstone, superintendent Western Union Telegraph Company, for permission to renew a pole at the corner of Fulton and Church streets for the purpose of running wires clear of the new Trinity building.

On motion of Commissioner Flower, permission was granted.

Communication read from W. H. Johnstone, vice-president North American Underground Telegraph and Electric Company, protesting against the awarding of the contract to the Consolidated Telegraph and Electrical Subway Company.

Ordered to be referred to counsel.

Counsel reported that he had received a communication from the Averill Insulating Company, notifying him of their intention to proceed against any company that would infringe their patents. The Arcade Railway Company gave notice that they had certain spaces allotted to them by the Legislature and that they would proceed against any company interfering therewith.

Mr. Sidney F. Shelbourne, president New York Electric Lines Company, also entered his protest against the contract being given to any but his company.

Mr. Edward Lauterbach, representing the Consolidated Telegraph and Electrical Subway Company, submitted for the inspection of the Commission a letter of acceptance from the company's list of patents under which they would operate.

Form of bond was also submitted, with the names of eleven gentlemen willing to sign as sureties.

The Board then went into executive session and decided that any five of the gentlemen named would be satisfactory sureties.

Board resumed public session.

Commissioner Flower proposed the following:

That Dr. A. R. Ledoux be appointed chemical expert and analyst for the purpose of making such examination and experiments as may be required by the Board.

Board adjourned until Wednesday, July 21, at nine a. m., when counsel is directed to report as to the form of the bond.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Wednesday, July 21, 1886. Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

Counsel reported that he had carefully scrutinized the bond proposed by the Consolidated Telegraph and Electrical Subway Company and had made certain additions, which he suggested the Commissioners should have inserted.

On motion, duly seconded, it was

Resolved, That the form of bond submitted by the Consolidated Telegraph and Electrical Subway Company be approved as amended, and that the counsel of the Commission be authorized, and he is hereby given, such authority to complete all necessary details and to make any additions or alterations which he may deem necessary, to fix the time for the beginning of the work of construction and the rate of progress to be made by the company and to have all papers ready for execution at the next meeting of the Commission.

On motion of Commissioner Flower, meeting was adjourned until Thursday, July 22, at three thirty p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Thursday, July 22, 1886, at three thirty p. m. Present: Commissioners Flower, Hess and Moss.

Reading of the minutes of the last meeting dispensed with.

On motion it was resolved, That Mr. Sefton's resignation as stenographer to this Commission be accepted and a vote of thanks be passed for his efficient services.

Mr. Edward Lauterbach, representing the Consolidated Telegraph and Electrical Subway Company, presented the bond for \$500,000, as required by this Commission, properly executed, which, after due consideration, was accepted with the sureties as appended.

Counsel for the Commissioners then made a statement to the effect that in order to avoid any misunderstanding in the future as to the meaning or interpretation of certain clauses in the contract about to be signed, he would give what he understood to be the meaning and asked Mr. Lauterbach, as the representative of the Consolidated Telegraph and Electrical Subway Company, if his company would approve of, and agree to the interpretation of the various clauses as presented. Mr. Lauterbach asked that counsel submit his views in writing, so that he could properly place the matter before his board of directors for action, and stated that he had no doubt but that they would heartily concur.

Whereupon Mr. Moss, as Secretary, signed the contract, provisionally, as did also Mr. Henry Fitzhugh, for the company, as its president.

Meeting adjourned to Tuesday, July 27, 1886, at three thirty p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Tuesday, July 27, at three thirty p. m. Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

President Flower read a letter from Mr. David Brooks, which was ordered to be referred to the engineers.

Counsel for the Commission stated that contracts and papers were completed and had been signed by the representatives of the company and proceeded to read the same.

Resolved, That this Commission accept and adopt the interpretation of the contract as read.

Agreed to unanimously.

Resolved, That in consideration of the promises made by the Consolidated Telegraph and Electrical Subway Company, and in consideration of their acceptance of our interpretation of the contract approved by us, and in consideration of the bond they have submitted, we hereby accept the proposal of said company and will sign the said contract.

Agreed to unanimously.

On motion of Mr. Flower, duly seconded, Mr. Moss was directed to sign the interpretation of the contract as read, as Secretary of the Commission.

Mr. Thomson, the engineer, stated that he expected to be able to submit report by next Tuesday.

Meeting adjourned to Tuesday, August 3, 1886, at three thirty p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Tuesday, August 3, 1886, at three thirty p. m.
Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

Letters from the Pennock Underground Conduit Company were read. The request in the first one to lay certain wires underground was on motion refused and referred to counsel to answer, and the second one was referred to the engineers.

On motion of Commissioner Hess:

Resolved, That John W. Totten be appointed messenger to the Commission, his appointment to date from August 1, 1886, and his compensation to be at the rate of seventy-five (75) dollars per month.

Application from Mr. John H. Hapgood, requesting permission from this Commission to run certain wires overhead along Third avenue between 116th street and 130th street, for the purpose of electrical lighting, was read and on motion the permission was granted temporarily, subject to the rules of the local authorities on the express conditions that no new poles were to be erected, and that said wires were to be placed underground as soon as a subway was provided for them.

Letter from Mr. Richardson was read and ordered filed for reference.

Col. H. S. Kearney read the report on the engineers.

Dr. A. R. Ledoux, chemist, read his report, and on motion it was

Resolved, That the reports of the engineers and chemist, as corrected, should be rewritten and be submitted to the Commission at its next meeting.

On motion meeting adjourned to Wednesday, August 4, at two p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Wednesday, August 4, 1886, at two p. m. Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

Letter from Mr. Geo. Richardson read and referred to the engineers.

Reports of the engineers and chemist were read, and on motion of Mr. Flower it was

Resolved, That the specifications and particular specifications read be accepted and copies served on the contracting company and filed with the Department of Public Works.

On motion of Mr. Hess:

Resolved, That the engineers be directed to prepare specifications for the remainder of the district selected, including an electric light system, to report at the next meeting of the Commission.

On motion of Mr. Moss:

Resolved, That the chemist is authorized to make proper disbursements on behalf of the Commission in carrying out of his work, and that of the engineers in the carrying out of their part of the work, the same to be reported to the Commission from time to time for allowance as the Commission shall see fit.

On motion of Mr. Hess:

Resolved, That the chemist and engineers continue their experiments to ascertain if any other shape of conduit is better adapted for other districts or streets than the one selected for those named.

On motion of Mr. Moss:

Resolved, That as soon as the samples of material to be used by the contracting company shall have been approved by the chemist, he shall give a public test of the strength of said material and of such other material as he shall see fit, on a day which he shall find convenient.

On motion of Mr. Hess:

Resolved, That the counsel of the Commission shall take such steps as he may deem necessary, on behalf of the Commission, for the filing of the important papers executed at the last meeting, in the proper quarters, and the Secretary is authorized to sign the same for the Commission.

Whereas, The Board of Electrical Subway Commissioners has heard with profound emotion the sad announcement of the death of Samuel J. Tilden, and deems it appropriate to enter the same upon their minutes. They recognize in the life and public services of Mr. Tilden a conspicuous and notable example of pure and upright American citizenship, deserving of universal emulation; and official ability, integrity and eminent usefulness which will ever serve as an illustrious example to all who may accept public position. This Commission, appreciating that suitable eulogy will be passed upon the distinguished dead in due time, and by competent authority, content themselves at this moment by directing this brief memoranda of the public bereavement and their personal appreciation of the very great loss sustained to be entered upon the minutes.

Resolved, That as a mark of respect for the memory of Mr. Tilden, this Commission do now adjourn without the transaction of further business.

On motion of Mr. Hess:

Resolved, That this meeting be, and is, adjourned subject to the call of the President on the request of any member of the Commission.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Tuesday, August 24, 1886, at three thirty p. m. Present: Commissioners Flower, Hess and Moss.

Minutes of the last meeting read and approved.

Mr. Thomson stated that the engineers were not ready to report as yet on a system of conduit which would include electric light wires.

Dr. A. R. Ledoux, chemist, read his report to the Commission; also a letter from Mr. W. O. Callender.

On motion, duly seconded, the report of Dr. Ledoux was accepted and ordered to be placed on file, and that his appointment of inspectors, as stated below, with hours and rate of pay per day be, and is, hereby approved.

E. A. Benjamin, Supervisor-in-Chief, seven a. m. to three p. m., \$3.00 per day. To remain permanently in employ of Commission.

Thomas A. Ryan, hours three p. m. to eleven p. m., \$2.00 per day, to be employed only when needed.

Patrick Walsh, hours eleven p. m. to seven a. m., \$2.00 per day, to be employed only when needed.

Mr. Lauterbach, counsel for the contracting company, stated that his company

was prepared to proceed with the work, and read a contract already made with Mr. J. D. Crimmins as an evidence of good faith, and that the work would be commenced as soon as the Commission could secure the necessary permit from the Department of Public Works to open the streets.

Mr. James Oliver stated that he had a new system for placing the wires underground, and was referred to the engineers.

On motion, duly seconded:

Resolved, That owing to the delay in receiving a permit from the Department of Public Works, the time set for the contracting company to begin work be extended until Monday morning, August 30, 1886.

On motion meeting adjourned subject to the call of the President on the request of any member of the Commission.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Tuesday, September 14, 1886, at three thirty p. m. Present: Commissioners Flower, Hess and Moss.

Minutes of the last meeting read and approved.

Communication from the Western Union Telegraph Company requesting permission to open trench for the purpose of laying an additional iron pipe on West street, from Dey street to Pier 16, was read, and on motion, duly seconded, it was

Resolved, That the Secretary notify the Western Union Telegraph Company that their request is refused, as being inconsistent with the general plan of the Commission.

The following preamble and resolution was read and adopted:

Whereas, It has come to our knowledge that the Western Union Telegraph Company has, in violation of the provisions of Chapters 534 of the Laws of 1884 and 499 of the Laws of 1885, requiring all wires for electrical purposes to be placed below the surface of the streets, except where in the discretion of the Board other arrangements are desirable for special reasons, and

Whereas, It is the duty of the Board to enforce these laws and to protect against their violation and to carry out so far as is in our power both their letter and their spirit; therefore be it

Resolved, That the following letters be signed by the President and counsel of the Commission for the Board, and sent to the Western Union Telegraph Company and the police authorities of the city respectively.

SEPTEMBER 14, 1886.]

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OFFICE OF THE
COMMISSIONERS OF ELECTRIC SUBWAYS,
1218 Broadway.

NEW YORK, September —, 1886.

To the President of the Western Union Telegraph Company:

SIR—It has come to the notice of the Board of Commissioners of Electric Subways that your company has, without the permission of the Board, and in defiance of law, placed telegraph wires above the surface of the streets of the city, and you are hereby notified to remove the same and to refrain from such action as is not in accordance with Chapter 534 of the Laws of 1884, and Chapter 499 of the Laws of 1885, in the conduct of your business in the future.

For the Board.

_____, President.

_____, Counsel.

Communication of the Holmes Electric Light Company was read and Mr. Holmes also spoke to the request. The matter was, by resolution, referred to engineers to report.

Report of Dr. A. R. Ledoux was ordered filed.

Particular Specification, No. 2, was read and adopted.

Communication from Mr. Sidney F. Shelbourne, president of the New York Electric Lines Company, was read.

Mr. Oliver appeared before the Commission on behalf of the O'Brien system.

Col. Kearney reported that the work of construction was satisfactory, except as to speed—and that would increase day by day.

Mr. Ledoux asked for permission to stop laying the conduit when necessary for one day.

Adjourned to executive session.

I. Resolved, That the appointment of Dr. Albert R. Ledoux, the chemical expert of the Commission, shall date from June 8, 1886. That the compensation of the chemical expert of the Commission shall be at the rate of \$200 per month in full for all opinions and advice called for by the Commissioners, and for his time spent in the superintendence of the manufacture and testing of materials used in the manufacture of the conduits ordered by the Board; but the chemical expert shall be entitled to all expense incurred on behalf of the Commission in said supervising, superintending and testing

in addition to the above compensation, and shall be entitled to employ and pay inspectors, order tests and analyses and pay for the same and charge the same to the Commissioners, and such of said charges as are proper will be allowed.

II. Resolved, That the appointment of Henry S. Kearney, the engineer of the Commission, shall date from July 1, 1886. That the compensation of the engineer of the Commission shall be at the rate of \$400 per month in full for all services rendered to the Commissioners; but the engineer shall be entitled to all expense incurred in behalf of the Commission in performing such services in addition to the above compensation, and shall be entitled to employ all necessary inspectors, draughtsmen and assistants, order tests and pay for the same and charge the same to the Commission, and such of said charges as are proper will be allowed.

III. Resolved, That the appointment of Mr. Daniel L. Gibbens, the counsel of the Commission, shall date from July 1, 1886. That the compensation of the counsel of the Commission shall be at the rate of \$200 per month in full for all services rendered to the Commission; but counsel shall be entitled to all expense incurred on behalf of the Commission in performing such services in addition to the above compensation, and in the conduct of the legal business of the Commission shall be entitled to charge to the Commission all proper fees, costs and disbursements, and such of said charges as are proper will be allowed.

IV. Resolved, That the engineer, chemical expert and counsel of the Commission shall keep severally in uniform books, provided for that purpose by the Secretary, full and accurate accounts of all expenses and indebtedness incurred by them on behalf of the Commission, and of all charges which they are by resolution of the Board entitled to, including their own compensation, said books to be kept by single entry, and to be the property of the Commission, and said books to be presented to the Secretary of the Commission every three months, during the first week in the month, beginning the first week of October, 1886, and the said books shall be accompanied with the voucher of the officers presenting them, together with such other vouchers as said officers may have received in the payment of said charges. And the voucher of the officer presenting the books and vouchers to the Secretary shall be as follows:

NEW YORK.....1886.

This is to certify that I....., of the Electrical Subway Commission of New York, am entitled to receive the sum of \$..... for compensation and proper charges as enumerated on pages of Cash Book No..... herewith presented for the quarter ending....., said compensation and charges being those allowed me by resolution of the Commission in the performance of my duties.

(Signed).....

And it shall be the duty of the Secretary of the Commission to carefully examine the said books and vouchers.

And the Secretary shall keep a similar book in which he shall enter in the same manner all payments made and indebtedness incurred by him on behalf of the Commission for stationery, rent, printing, etc., etc., and no other members or officers of the Commission shall make any payments or incur any indebtedness on behalf of the Commission unless authorized by resolution of the Board; but the amount of the salaries of the Commissioners and of the assistant secretary and of the messenger of the Commission shall be entered in the above mentioned book, to be kept by the Secretary.

V. And it shall be the duty of the Secretary of the Commission to keep two books of uniform size, etc., one of which shall be marked "A," and the other "B," said books to be the property of the Commission and to be presented to the Board once in three months, commencing at the first meeting of the Board in October, 1886.

And it shall be the duty of the Secretary to enter at large upon the said books all the items contained in the books authorized by the Board to be kept by the engineer, chemical expert and counsel of the Commission, as well as those items authorized to be kept in a similar book by the Secretary, as follows:

In book "A" he shall enter all the items referred to which by contract are properly chargeable to the Consolidated Telegraph and Electrical Subway Company, and in book "B" he shall enter all the other items, and in determining any particular case in which he may be doubtful he shall be guided by the counsel of the Commission, and he shall note against each entry whether or no it is accompanied by any voucher other than the voucher of the officer making the charge.

And the Secretary shall present to the Commission every three months transcripts from books "B" and "A," which shall be examined by the Board and then transmitted, together with the accompanying vouchers and such other vouchers as may be in form approved in each case by the comptroller and counsel of the Commission, to the Comptroller of the State and the Consolidated Telegraph and Electrical Subway Company, respectively, for payment.

And the payment by the Consolidated Telegraph and Electrical Subway Company of charges approved by the Board shall be made to the Secretary of the Commission, who shall give his receipt therefor and shall make the proper payments from the fund so received, taking proper receipts for all payments so made.

VI. And all the books, papers and vouchers of the Commission shall at all times be open to inspection as is by law provided they shall be when placed on file in the office of the Mayor at the expiration of the term of office of the Commissioners.

Adjourned to Tuesday, October 5.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Tuesday, October 5, 1886, at three thirty p. m. Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

Letter from the Western Union Telegraph Company, requesting permission to place two cables on the structure of the Third Avenue Elevated Railroad, was read, and on resolution, duly seconded, the request was granted and the counsel was requested to draw up a permit such as was required in the matter.

Col. Kearney, engineer, reported the subway complete from 24th street to 33rd street, and from 34th street to 36th street, and that he expected the work to be completed to 59th street in about twenty-four working days, and that the material and construction were satisfactory. Work would be commenced on the line below 23d street, on Sixth avenue, to Carmine street, as soon as permits were received from the Department of Public Works.

The time for commencing work on particular Specification No. 2 was extended for ten days from October 6.

Resolved, That the engineer of the Commission, after consultation with the superintendents of the different electrical companies as to their needs, report to this Board on Friday next plans and specifications for a subway between Courtlandt street and the Battery.

Dr. Ledoux, chemist, reported on the material used in the subway as satisfactory, giving statistics as to number of sections turned out by the Dorsett Company, number condemned, etc., etc.

Col. Kearney, engineer, was directed to report on the O'Brien system, presented by Mr. James Oliver.

Adjourned to Friday, October 8, at three thirty p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Friday, October 8, 1886, at three thirty p. m. Present: Commissioners Flower, Hess and Moss.

Minutes of the last meeting read and approved.

Applications for permission to stretch new lines of wires for electrical purposes were received from the following: American Electric Manufacturing Company, E. W. Ebbitts & Co., Edward Macy and Harlem Electric Illuminating Co., and on resolution they were referred to Commissioner Hess to investigate and report.

Adjourned to Tuesday, October 12, at three thirty p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the office, No. 1218 Broadway, on Tuesday, October 12, 1886, at three thirty p. m. Present: Commissioners Flower and Moss.

Minutes of last meeting read and approved.

Commissioner Hess not being present, the meeting adjourned to Tuesday, October 19, 1886, at three thirty p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the office, No. 1218 Broadway, on Tuesday, October 19, 1886, at three thirty p. m. Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

Application from the Western Union Telegraph Company for permission to run wires to various clubs and headquarters, for the purpose of sending election returns (said wires to be removed by November 3) was read and permission granted.

Commissioner Flower offered the following resolution, which was adopted:

Resolved, that the Subway Company be, and hereby is, instructed to prepare a duct for the use of the Fire Department of this city, and report to Mr. J. Elliott Smith, superintendent of the Fire Department, when they are ready to receive the cable, and between what streets on Sixth avenue the conduit was ready for use.

Report of Commissioner Hess on the granting of permits to various applicants for the purpose of stringing new wires in Harlem was read, and, on motion, duly seconded, was adopted and ordered placed on file.

On motion, duly seconded, it was:

I. Resolved, That Mr. Moss be appointed a committee to ascertain and report at the next meeting the number of telegraph and telephone poles and wires on Sixth avenue, from 24th to 42nd streets, and the companies owning the same, with an estimate of the time necessary to be allowed for the substitution therefor of wires in the conduit already completed, and the removal of the said poles and wires from above the surface of the street; and

Resolved, That he also ascertain and report as to through lines of telegraph and telephone wires on Seventh avenue and Broadway, and whether any of them can be ordered into the Sixth avenue conduit without diminishing the efficiency of the service, and if so, specifically as to these.

On motion of Mr. Moss it was

Resolved, That Engineer Kearney be directed to make report at the next meeting as to having a twenty-duct conduit laid through 125th street, said plan and work not to interfere with the advancement of the work on Sixth avenue.

The Secretary was authorized to sign the following letter:

OFFICE OF THE BOARD
OF
COMMISSIONERS OF ELECTRICAL SUBWAYS,
1218 Broadway.

NEW YORK, October 19, 1886.

TO HON. E. HENRY LACOMBE, Counsel to the Corporation:

DEAR SIR—Your letter relating to a permit granted by the Board to The Harlem Electric Light Company has been received.

As you say, the permit was a mere temporary dispensation from the placing of wires underground, and did not presume to be a grant of right.

Like all of the temporary permits of the Board, it was issued "*subject to the rules and regulations of the local authorities,*" and if such rules and regulations have not been complied with it has no value whatever.

Very respectfully, etc.,

_____ For the Board.

On motion of Commissioner Flower it was

Resolved, That the accounts against the company be presented at the next regular meeting of the Board for audit.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Tuesday, October 26, 1886, at three thirty p. m.
Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

On motion of Commissioner Flower:

Resolved, That the account due from the Construction Company to the Commission for inspectors and expense, be presented to the company by the Secretary for payment.

Letter from the Western Union Telegraph Company, requesting permission to extend its cables along the Third Avenue Elevated Railroad to Harlem River, at 128th street, was referred to counsel, with request to ascertain if the work was necessary to conduct their present business, and if so, the permit would be granted.

Applications from the Metropolitan Telephone Company to erect new poles on 58th street, in place of old ones, considered dangerous, was referred to Commissioner Hess.

Application from the Manhattan District Telegraph and Messenger Company to renew certain wires and stretch new ones in Harlem, was referred to counsel.

Engineer Kearney reported that plans for a conduit through 125th street would not be ready until Monday next.

On motion of Commissioner Flower it was

Resolved, That the Board peremptorily calls upon the construction company to begin within two weeks and construct with due diligence conduits complying in all respects with the requirements and specifications of the Board, as follows:

- (1) From Fourteenth street and Sixth avenue south to Carmine street (twenty-four ducts).
- (2) From 125th street and Lexington avenue west (thirty ducts).
- (3) Through Varick street.

The material to be used to be submitted and satisfactory to the chemist, and the construction to be done under the direction of the engineer of the Commission.

This work not to retard or interfere with the progress of the work on Sixth avenue; and

Resolved, That the Board calls upon the construction company to show that satisfactory arrangements for this work have been made at the next meeting of the Board on Monday at three thirty p. m.

Mr. James Oliver, representing the O'Brien system of underground wires, was requested to consult with the engineer, who would report to the Commission.

The Mount Morris Electric Light Company presented a letter asking that they be permitted to occupy space in the conduit when laid in the Harlem district, was read, and the request was granted. Application ordered on file for future reference.

The chemist, Dr. Ledoux, reported that the work of the Dorsett Company was going on satisfactorily, except as to speed, and stated that of the 2,243 sections tested only 160 had been condemned.

Meeting adjourned to Monday, November 1, 1886, at three thirty p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Monday, November 1, 1886, at three thirty p. m. Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

Letter from the Western Union Telegraph Company was read and the following resolution was offered by Commissioner Flower and adopted:

Resolved, That permit be granted to the Western Union Telegraph Company to run wires on Third Avenue Elevated Railroad, from South Ferry to Harlem River, until such time as a subway is completed, *provided* that by the first day of January, 1887, the Western Union Telegraph Company's poles along the same route, from South Ferry to the Harlem River, be removed from the streets.

Report of Commissioner Moss was read, approved and ordered on file, as follows:

NEW YORK, November 1, 1886.

To the Commissioners of Electrical Subways:

GENTLEMEN—In accordance with resolution passed by you, I have made a survey of the poles and wires on Sixth avenue, from 21st street to 42nd street, and report as follows:

The Metropolitan Telephone and Telegraph Company have in use between the points named sixty-five poles, upon each of which are stretched an average of one hundred and fifty wires. The Western Union Telegraph Company have thirty-five poles each, bearing on an average twenty-four wires.

Between 21st street and 34th street about twenty-five of the telephone company's poles are being used by electric light companies for supporting their electric light wires, and these poles cannot be removed until some provision is made for placing electric light conductors under ground, unless permission be given to substitute shorter poles for them.

The poles owned by the Western Union and the telephone company seem to have been used also by the messenger and fire alarm services for carrying their wires, but as those services, as well as the telephone and telegraph, can be accommodated in the subway, there is no reason why the poles bearing them should be permitted to remain standing longer than is necessary to duplicate the services underground.

I would therefore recommend that notice be given to the Metropolitan Telephone and Telegraph Company, and to the Western Union Telegraph Company, that the subway on Sixth avenue, from 21st street to 59th street, will be in readiness for the reception of wires say after November 15, and that under the powers conferred by law upon the Commissioners they are required within sixty days to remove from the surface of Sixth avenue, between 21st street and 59th street, all electrical conductors now carried upon the poles owned by them respectively, whether those conductors belong to and have been placed there by them or by other companies with their consent.

The time mentioned will, I think, afford ample opportunity for the companies to

duplicate underground their present overhead services, and to make all necessary provisions so that their efficiency may not be impaired.

Regarding the through lines on Seventh avenue and Broadway, I would recommend that the telephone company and the Western Union Company be requested to utilize the subway on Sixth avenue for the accommodation of trunk lines wherever they can do so without requiring to erect new poles for the purpose of connecting with the subway, but until the underground provision extends further south, say to Canal street, this request cannot be complied with to any but a limited extent.

Yours respectfully,

THEODORE MOSS.

Resolved, That the counsel draw up a proper notification to the companies mentioned in above report and serve the same.

Request of Metropolitan Telephone Company to lay their own cables underground on Broadway and Spring street was objected to and laid on table.

Mr. Lauterbach, appearing for the construction company, in response to a resolution passed at the last meeting, requested that a consultation between all the engineers of the various interests be had to arrive at the best possible manner of building a conduit through 125th street and 58th street. The Commission directed the engineer to consult as to what streets to be used and to form and size of conduit, and the chemist to examine and report on material to be used. Reports to be made Saturday.

Adjourned to Saturday, November 6, at three thirty p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Saturday, November 6, 1886, at three thirty p. m. Present: Commissioners Flower, Hess and Moss.

Minutes of last meeting read and approved.

The following form of notification to remove poles along routes where a conduit was completed and ready to receive wires was adopted:

You are hereby notified that under a general plan, caused to be devised by this Board in accordance with law, a subway for electrical conductors will be completed on and under Sixth avenue, from 21st street to 59th street, by the 15th of the current month. Forty-five days from that day are allowed you to prepare cables, etc., for doing your business in said Sixth avenue through the subway and for removing your poles from the street along the route named.

After the first day of January, 1887, the continuance of any of your poles along the route specified will be in violation of law, and action will be taken by the Board

looking to their removal, except on good and sufficient reason shown for failure to comply with this notice.

For the Board.

Secretary.

To the Company, New York City.

Application from the Manhattan District Telegraph and Messenger Company to stretch certain new wires, etc., was read, and, on motion, duly seconded, the same was laid on table.

Application from the Edison United Manufacturing Company for permission to lay an underground electric light cable for private service, from the corner of Madison avenue to 50th street, to No. 634 Fifth avenue, was read, and on motion the permit was granted, temporarily, under the rules.

Dr. Ledoux, chemist, reported that he had not completed his tests of paper tubes, a number of samples having been received by him only this day, and that he would have his tests completed and be ready to report by the next meeting.

Mr. Lauterbach requested that the engineers of the Commission be authorized to consult with the engineers of the construction company and of the electric companies interested, so that a plan substantially fulfilling all the various requirements as to routes, capacity, etc., could be agreed upon for 57th, 58th or 59th streets, east to the river, and also from the Brooklyn Bridge to Cortlandt street. The engineers were directed accordingly.

The proposition of the Metropolitan Telephone Company and of the construction company for an extension of the facilities of the Brook's system, already laid along Spring street to the North River, was laid on table until the next meeting of the Board, and the engineers were directed to report how many poles along said route would be removed in case said proposition was entertained by this Board.

Commissioner Flower notified the Board that he had tendered his resignation to Governor Hill.

Adjourned to Thursday, November 11, 1886, at three thirty p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Thursday, November 11, 1886, at three thirty p. m. Present: Commissioners Hess, Gibbens and Moss.

Minutes of the last meeting read and approved.

Commissioner Hess nominated Mr. Moss for President of the Board to fill the vacancy occasioned by the resignation of Commissioner Flower. Mr. Moss declined the honor, and moved that Mr. Hess be made President of the Board, the motion being seconded by Mr. Gibbens and carried. Mr. Hess took the chair.

The following resolutions were offered by Commissioner Hess and unanimously adopted:

Resolved, That the Board of Commissioners of Electrical Subways for the City of New York, has learned with deep regret of the resignation of its President, Hon. Roswell P. Flower, who by his steadfastness of purpose, devotion to duty and well directed energy while a member of the Board has proved himself a most efficient and capable public servant and earned the respect and esteem of his fellow members; and

Resolved, That a copy of these resolutions, suitably engrossed at our own private expense, be presented to Mr. Flower as a slight token of our regard and as a remembrance of the harmonious spirit which has prevailed in the Board and effectually inaugurated and insured the ultimate success of its labors during the time that he has been our colleague.

After hearing the report of Engineer Kearney, who considered 58th street as the best route for a conduit from Sixth avenue to the East River, or as far east as necessity called for, on motion of Commissioner Gibbens it was resolved that 58th street be selected as the street through which the conduit should be laid.

Engineer Thomson, of the Construction Company, reported that the route mutually agreed upon from the Brooklyn Bridge to Broadway and Cortlandt street was through Broadway to Mail street, thence through Park Row to terminus of the Bridge, and the intention was to lay six iron tubes, three inches in diameter inside, six two and a half inches in diameter inside, and six additional tubes, yet to be determined on, all to be imbedded in hydraulic cement.

It was suggested by Commissioner Gibbens that the consent of the Park Commission be obtained if possible to allow the conduit to be laid through City Hall Park as an advantage over the route proposed.

Commissioner Gibbens, after having ascertained from Mr. Thomson that two weeks' time would be necessary before commencing the actual work of laying the conduit, proposed the following resolution, which was adopted:

Resolved, That the work as suggested and approved by all the engineers be

commenced on Monday, two weeks hence, and carried on with due diligence until completed.

The matter of material to be used in the conduit through 58th street was referred to the chemist and engineer of the Commission, and report, if possible, at the next meeting of the Board.

Chemist Ledoux read his report, which was accepted and ordered placed on file.

Mr. Lauterbach, of the Construction Company, asked for directions and permission to lay a section of conduit, with three ducts, from Broadway and Spring street to the North River, the tubes to be three inches in diameter, imbedded in asphalt. On motion of Commissioner Gibbens the work was directed to be commenced two weeks from Monday next, and proceeded with with due diligence.

Commissioner Gibbens called the attention of the Board to the fact that the Sixth avenue conduit would be completed in a very few days, and suggested that the plans for the extension of any and all other routes be presented, and on motion it was

Resolved, That the Construction Company and engineers be ready to report on such new work and routes at the next meeting.

On application of the Construction Company, and with the approval of Engineer Kearney, permission was granted to lay a section of conduit on West street, from Liberty street to Cortlandt street, with one pipe, three inches in diameter, for the use of the Metropolitan Telephone Company, and one pipe, four inches in diameter, for general or public use, all to be imbedded in hydraulic cement.

In answer to a question of Commissioner Gibbens, Engineer Beckwith, representing the Metropolitan Telephone Company, stated that he had nothing definite to report as to what steps his company were taking preparatory to placing their wires in the conduit already prepared on Sixth avenue and for the removal of their poles along that route, but hoped to be able to make a report on the subject soon, perhaps by the next meeting of the Board.

Commissioner Gibbens offered a resolution that a permit be granted to the Manhattan District Telegraph Company to make necessary repairs to its wires and to complete the additional service they require without erecting any new poles, subject to the rules and regulations of the local authorities, such permit to be temporary.

Commissioner Hess objected, on the ground that the application was so general that if granted as it stood it would cover some twenty-six blocks, and on motion it was

Resolved, That the application for permit from the Manhattan District Telegraph Company should be made out and presented in the same manner and form as those coming from other companies, specifying separately the points to and from which the

wires were to be run, and on such presentation the application should be granted, a separate permit to be issued in each case.

Commissioner Gibbens called the attention of the Board to an application from the Business Men's Messenger and Telegraph Company, duly incorporated, to string new wires along the house tops in the Harlem districts, and offered the following resolution:

Resolved, That the permit be granted after the application had been made out in the usual form, showing also satisfactory evidence that the company was a necessity to the public in the district named.

Commissioner Moss objected to the resolution, and it was withdrawn.

On motion it was resolved that the matter be referred to Commissioner Moss, with power.

Adjourned to Tuesday, November 16, at three o'clock.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Tuesday, November 16, 1886, at three o'clock. Present: Commissioner Hess, Gibbens and Moss.

Minutes of last meeting read and approved.

Chemist Ledoux reported that no samples of paper tubes that were satisfactory had as yet been received. That he had examined the samples of zinc tubes proposed to be used and that they were entirely satisfactory, and he saw no objection to them being used in 58th street.

Engineer Kearney reported that he had no objection to zinc tubes being used, and on motion of Commissioner Gibbens it was

Resolved, That the plan submitted by the engineer and chemist for the proposed conduit in 58th street, viz., zinc tubes imbedded in some kind of asphaltic cement, be approved by the Commission, and that the Construction Company be, and hereby are, authorized to begin work by the 29th inst., the number of ducts to be determined on at the next meeting of the Board.

Commissioner Gibbens requested Engineer Kearney to examine the samples of the Averill Company and report at the next meeting.

Engineer Thomson, of the Construction Company, asked permission to construct a conduit from Third avenue to Fourth avenue, in 128th street, and from thence to

Harlem River, to connect the cable house of the Western Union Telegraph Company with their cables on Third avenue, conduit to have six ducts of iron tubes, imbedded in hydraulic cement.

Mr. Brown, superintendent of the Western Union Telegraph Company, stated that on completion of this work the poles along this route, from Cortlandt street to Harlem River, would be removed. On motion of Commissioner Gibbens it was

Resolved, That the permission asked for be, and hereby is, granted.

Mr. Beckwith, of the Metropolitan Telephone Company, stated that cables had been ordered, and that they were preparing to place the same in the conduit on Sixth avenue, and if after trial the working was satisfactory, the company would have no desire to keep any of their poles up along the route.

Applications were received from the Metropolitan Telephone Company to renew certain dangerous poles in and near Hester street. On motion of Commissioner Gibbens they were laid on the table pending an inquiry to ascertain if said poles could not be removed entirely by having a conduit with the necessary facilities in that section.

The matter of claims from the estate of the late Commissioner Charles E. Loew were referred to Commissioner Gibbens.

Adjourned to Friday, 19th inst., at three p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Friday, November 19, 1886, at three p. m. Present: Commissioners Hess, Gibbens and Moss.

Minutes of last meeting read and approved.

Engineer Kearney reported that the Park Commissioners had granted a permit to have the conduit put down through Mail street.

An application from the Western Union Telegraph Company to remove certain poles and erect new ones, those in present use being considered positively dangerous, was referred to Commissioner Moss, with power.

Commissioner Hess called the attention of the Board to the fact that the United States Illuminating Company had erected a large pole in front of the Casino, corner of Broadway and 39th street, and on motion of Commissioner Gibbens it was

Resolved, That if no permit had been granted in this case the matter be laid before the Superintendent of Police, to prevent such violation of the law in future.

Colonel Kearney reported that fifteen ducts had been decided on as sufficient to meet the requirements in 58th street. The matter of material had not yet been decided on. Samples from the Averill Company were at this time being subjected to tests to see if the material would hold its shape in heat and up to what degree, etc.

On motion of Commissioner Gibbens it was resolved that the engineers be directed to report on a conduit to go through 21st street at the next meeting.

The matter of application of the Western Union Telegraph Company to string six wires on poles in 24th street, also eight wires from Wall street to No. 80 Broadway, was referred to Commissioner Gibbens.

Engineer Kearney stated that the report on the materials to be used in the 58th street conduit would be ready at the next meeting.

Adjourned to Tuesday, November 23, 1886, at three p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Tuesday, November 23, 1886, at three p. m. Present: Commissioners Hess, Gibbens and Moss.

Minutes of last meeting read and approved.

Colonel Kearney, engineer, reported that materials to be used in 58th street conduit were still under tests, which, he thought, would be concluded by the next meeting of the Board.

Engineer Thomson, of the Construction Company, reported that work on the West street section would be commenced on Wednesday, and on the Brooklyn Bridge and Spring street sections probably on next Monday, and on motion of Commissioner Gibbens he was directed to give the necessary order for zinc tubes for the 58th street work, the same to be coated same as the iron tube submitted.

On motion of Commissioner Gibbens it was resolved that the Chair appoint a committee of one to wait upon the Comptroller of the State in reference to the payment of the salaries and necessary expenses of this Commission. Commissioner Gibbens was appointed by the Chair, with a request to report at the next meeting.

Hon. Thos. Ecclestine, on behalf of the Westinghouse Electric Lighting Company, requested permission to lay conduits for the especial accommodation of their own wires.

Commissioner Gibbens stated in reply that the question of facilities for the under-

ground accommodation of electric light wires was now under the consideration of the Commission, and that when some general plan had been decided on it would meet the requirements of their company as well as those of all other electric light companies. The Westinghouse Company was requested to submit a comprehensive plan of the routes they wish to use.

In reply to Mr. James Oliver's request in favor of the O'Brien system, he was informed that the system he represented was in the hands of the engineer of the Commission, who would in due time report on the same.

On resolution, the engineer was directed to report at next meeting some route for an electric light and power conduit, and to suggest to the Commission some form or plan of conduit for that particular route that would accommodate arc, incandescent and power wires.

The Holmes Burglar Alarm Company was granted permission to erect a pole in the vacant lot corner of Fifth avenue and 84th street, and if permission of property owners at 58th street and Madison avenue and 52d street and Sixth avenue was refused to place a box on their buildings, permission would be granted by this Board to erect poles in those two places.

Permission was granted to the Electrical Power Company to run a wire from Spruce and William streets to Pine street, on the poles of the Baltimore and Ohio Telegraph Company, provided that permission be first had and submitted from the Baltimore and Ohio Telegraph Company.

Permission was granted to the Metropolitan Telephone Company to erect two poles on Sixth avenue, all other permits requested to lay over until the next meeting of the Board.

Adjourned to Tuesday, November 30, at three p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Tuesday, November 30, 1886, at three p. m. Present: Commissioners Hess, Gibbens and Moss.

Minutes of last meeting read and approved.

Engineer Kearney reported that the Commissioner of Public Works was opposed to granting any more permits to open streets, particularly Broadway, at this time of year; that he still had an application under consideration.

Engineer Thomson, of Construction Company, reported that he had advices of shipment from Philadelphia of 7,500 feet of two and one-half-inch pipe, and that the balance would follow at the rate of 1,500 feet per day.

An application from the Mount Morris Electric Light Company to place certain wires above ground in the vicinity of 110th street, also to string wires on poles already erected, was referred to Commissioner Gibbens, with power.

On motion of Commissioner Gibbens it was resolved that a permit be granted the Western Union Telegraph Company to string wires and replace poles along the railroad lines in the annexed district above the Harlem River, said permit to be good for six months.

On motion of Commissioner Gibbens it was resolved that a permit be granted to the Western Union Telegraph Company to lay their cables in their own conduit, from Dey street to 23d street, and make connection at 23d street and Fifth avenue with their office, of their cables now on the Third Avenue Railroad. Superintendent Brown, of the Western Union Telegraph Company, stated that this permit would allow the company to take down their poles on Third avenue in January. Secretary was instructed to state on the permit to be granted, that the Commissioners were not conceding anything as to the right of a company to use its own conduit in opposition to the general plan of the Commission.

Adjourned to Thursday, December 9, or subject to the call of the Chair.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Thursday, December 9, 1886, three p. m. Present: Commissioners Hess, Gibbens and Moss.

Reading of the minutes of the previous meeting dispensed with.

Engineer Kearney reported that the material for the 58th street and 128th street work was on hand, but that he thought it inadvisable to commence work in the present condition of the weather.

On motion of Commissioner Gibbens it was resolved that the question of commencing work on any of the proposed routes be left to the discretion of the engineer, and for him to notify the Construction Company when to proceed.

Mr. Beckwith, of the Metropolitan Telegraph and Telephone Company, stated that his company proposed to lay their cables in the conduits that were ready by January 1.

Superintendent Brown, of the Western Union Telegraph Company, stated that his company had already ordered cables for the Sixth avenue conduit, which he expected here by the 15th inst.

Commissioner Gibbens made request that the Secretary report on the application of the Business Men's Messenger Company, of Harlem, to temporarily string wires along house tops where permission had been granted them to do so.

Application of the United States Illuminating Company to erect three poles on Ninth street, between Broadway and Fourth avenue, for electric lights for E. J. Denning & Co., referred to the engineer to report on same at next meeting.

In the matter of application from District Telegraph and Burglar Alarm Company of Harlem, on motion of Commissioner Gibbens it was resolved that permission be granted them to repair its existing lines, and when they desire to make extensions a separate request for each case shall be made to the Secretary, stating reasons, etc., etc.

On motion it was resolved that the application from Harlem Lighting Company, to stretch wires on Baltimore and Ohio telegraph poles, from 106th to 130th streets, also from 110th to 115th streets, be granted temporarily to meet the wants of the merchants in that vicinity.

Application by General Huidekoper on behalf of the Metropolitan Telephone Company, to renew some 483 poles on Kingsbridge Road, Tenth and Eleventh avenues, in the annexed district, and to connect with the subway at 58th street; 58 old poles would be removed and only 8 new poles would be required. The board decided not to act on the application immediately, the engineer to examine into the matter in the meantime.

Adjourned subject to call of the Chair.

In executive session immediately after general meeting it was

Resolved, That proceedings be commenced by action to restrain the New York Underground Telegraph Company from laying underground any wires or conduits, and that Charles A. Hess be authorized and empowered to commence and maintain action to bring about such result.

Adjourned subject to call of the President.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Friday, December 17, 1886, at three thirty p. m. Present: Commissioners Hess, Gibbens and Moss.

Minutes of previous meeting read and approved.

On motion of Commissioner Gibbens permission was granted to the United States Illuminating Company to string wires to connect electric lights on Ninth street for the use of Messrs. E. J. Denning & Co., brackets to be hung on their building, but no poles to be erected.

Engineer Kearney reported that all inspectors had been discharged as the weather would not permit a continuance of the work, and more particularly for the reason that the Department of Public Works would not allow but 200 feet of the stretch to be opened at a time.

Commissioner Gibbens presented a bill for services of F. W. Adams, court stenographer, for \$75, and asked that the same be entered in the Secretary's accounts.

Engineer Kearney presented a bill for services of James Feeney, inspector, for November, amounting to \$78, which was approved.

On motion of Commissioner Gibbens, Assistant Engineer North, to be retained at a salary of \$200 per month from December 1, was approved.

The following resolutions were adopted:

To have a map made showing the main lines of electrical conductors and indicating proposed routes for subways yet to be built.

To empower the engineer to consult with electrical companies as to what routes each required, the class of conductors, mode of distribution, percentage of increase and accommodation likely to be needed.

To protect all companies using space for their temporary needs under permission of the Board from any encroachment by rival companies.

To have the engineer state his views as to what kind of conduit would be most desirable for the accommodation of the electrical conductors.

Such map to be made in sections, the proposed routes to cover at least twenty miles, five of which must be electric light routes. The engineer to be ready to report within six weeks.

The Metropolitan Telephone Company was granted a permit to renew their pole line above 58th street and Tenth avenue and Kingsbridge road, a copy to be filed with the Mayor.

Commissioner Gibbens reported that he had been served with papers in a suit brought by Mr. Johnstone against the Commission relative to patent cases.

Adjourned subject to call of the Chair.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Saturday, January 29, 1887, at three p. m. Present: Commissioners Hess, Gibbens and Moss.

Minutes of previous meeting read and approved.

Application of the Edison Underground Illuminating Company for a permit to lay trenches in the district bounded by Third and Eighth avenues, and from 18th to 59th streets was, on motion duly seconded, laid on the table, and a copy of the plans placed on file.

The application of the Harlem Electric Illuminating Company for a permit to erect temporary iron supports along Third avenue from 86th to 130th streets, and on 125th street from Fourth to Eighth avenues, on account of the opposition encountered from the Board of Fire Underwriters to house top fixtures as used by the company was, on motion of Commissioner Gibbens, duly seconded, referred to the engineer to report upon at the next meeting and to have ready a plan of the operation of the conductors of said company showing the points where such supports are to be erected, the number of wires employed, etc., a copy of which to be filed in the office of the Mayor.

On motion of Commissioner Gibbens, the engineer was directed to report at the next meeting on the matter of the erection of the pole line above 58th street and Tenth avenue by the Metropolitan Telephone Company.

A letter of complaint from the Department of Public Works, charging that a leak was caused in the vault in front of No. 896 Sixth avenue by the construction of the subway conduit, was referred to the engineer to report at the next meeting.

Engineer Kearney submitted his report to the Board, containing a list of all applications received from trench line, reporting progress in the matter of removal by the Western Union Telegraph Company of poles and wires along Third avenue and the use of cable along the "L" structure instead, and naming the routes on which work should be begun as soon as the weather would permit, and on motion, duly seconded, it was

Resolved, That maps and specifications for the work proposed be submitted to the Board and that the propositions contained in said report be separately acted upon at the next meeting.

Application was received from Gen. Huidekoper on behalf of the Metropolitan Telephone Company for permits for subways to be constructed from Cortlandt street down Broadway to Exchange Building in lower Broadway, and on motion of Commissioner Gibbens it was

Resolved, That the construction company be authorized to order the necessary material for said work and directed to proceed with same as soon as the weather would permit.

On motion of Commissioner Gibbens it was

Resolved, That the construction company be directed to build manholes for a conduit at 21st street and Sixth avenue as soon, after a permit was granted by the Commissioners of Public Works, as possible.

Adjourned to Tuesday, February 1, at three p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Tuesday, February 1, 1887, at three p. m. Present: Commissioners Hess, Gibbens and Moss.

On motion, reading of the minutes of the previous meeting was dispensed with.

A communication from Mr. S. F. Shelbourne, president of the New York Electric Lines Company, desiring the approval of the Board to its maps and plans for the proposed construction of conduits for underground conductors was laid on the table.

Specifications and plans for the following sections, namely:

For the Baltimore and Ohio Company, Broadway and Canal street, to Spring street, thence to West street, along West street to 14th street; for the Metropolitan Telephone, from First to Eighth avenues, through 58th street; for the Western Union and Metropolitan Telephone Company, Broadway, between Fulton and Vesey, along Park Row to the terminus of the Brooklyn Bridge, were laid before the Commissioners, and on motion it was

Resolved, That said work be begun thirty days from date or sooner, the weather permitting and that the said specifications be filled out to that effect, signed by the Secretary and transmitted to the construction company.

A temporary permit was granted the Harlem Electric Lighting Company to erect four cables on iron supports to be twenty feet above and four feet below the surface and 2½ inches in diameter along Third avenue from 86th to 170th street, and on 125th street, between Third and Eighth avenues, provided that the assent of the several property owners be obtained thereto.

A bill of the chemist and engineer against the construction company, amounting to \$140.79, was, on motion, duly approved and signed by the Secretary.

A letter of application on behalf of the Baltimore and Ohio Company for a permit to lay 6,000 feet of iron pipe, that cannot by their present system be drawn into ducts through manholes, alongside of the proposed subway from No. 63 Broadway to Canal street and Broadway, was read, and on motion it was

Resolved, That the Secretary reply to the effect that while the Commission adheres to its system of drawing in and out through manholes that the request will receive the attention of the engineer.

Commissioner Gibbens offered a resolution That a committee of one be appointed to draft a report of the progress made by the Commission during the past year for presentation to the Comptroller, Governor, Mayor, Department of Public Works and the Legislature, to be submitted to the Board at its next meeting.

On motion of Commissioner Hess, duly seconded, Commissioner Gibbens was so appointed.

Meeting adjourned to Friday, February 4, at three p. m.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Friday, February 4, 1887, at three p. m. Present: Commissioners Hess, Gibbens and Moss.

Reading of the minutes of the previous meeting dispensed with.

Commissioner Gibbens, committee of one, appointed at the last meeting to prepare the third report of the Board, submitted the following:

HON. DAVID B. HILL, Governor of the State of New York,

HON. ABRAM S. HEWITT, Mayor of the City of New York,

HON. EDWARD V. LOEW, Comptroller of the City of New York,

HON. JOHN NEWTON, Commissioner of Public Works,

GENTLEMEN—From the organization of the Commission until the last part of June, 1886, the work of the Board consisted chiefly in the examination of many different forms of conduit proposed and in the investigation of the many questions which entered into the problem to be solved by the Board.

On the 30th of June, 1886, the Commissioners adopted a report which analyzed and described the different plans, models, etc., which had been examined by them, and generally discussed the different systems of conduits for the placing of electrical conductors underground, both in use and proposed.

The conclusion arrived at in that report was, briefly, to the effect that the problem of removing the electrical conductors from the surface of the streets and operating

them underground was rather one of a mechanical than of an electrical nature. In other words, it was found by the Commission that the conduit to be built should be modeled with an eye to the existing engineering difficulties to be met in the streets of New York, filled, as they are in most instances, with many kinds of pipes, contact with some of which would be dangerous, and deleterious subterranean influences, such as gases, escaping steam, salt water, etc., which, if allowed to come in contact with the electrical conductors, would be of serious injury to them; and still further, to the convenient placing, repairing, connecting, distributing and removing of electrical conductors, rather than to the questions of retardation and induction which proper insulation of the conductors would practically obviate.

To follow the language of that report, "a conduit is nothing more, electrically and mechanically, than a protection for the wires within it, and a convenience for placing them underground."

FAILURE OF ELECTRICAL COMPANIES TO SUBMIT SUITABLE PLANS.

During the year that the Commission was investigating these questions, the time which was allowed by law for the filing and submission of plans by the electrical companies expired without any such action on the part of those operating electrical conductors.

The Commission was informed by the Attorney-General, at its own request, that should the electrical companies fail to submit plans suitable for placing their electrical conductors under the surface of the streets, within sixty days from the passage of the Act creating the Commission, it became the duty of the Commission to cause to be devised and made ready for use such a general plan as should meet the requirements of the Acts under which the Board was organized, and under this general plan to construct suitable conduits for electrical conductors, and compel the use thereof by the companies operating the same.

In view of the fact that nearly forty electrical companies are at present operating conductors in the City of New York, and that many of the streets of the city are fairly well occupied for many feet below the surface, so that the construction of a separate system by each company operating electrical conductors would be in many cases impracticable and everywhere a source of great inconvenience to the public and result in confusion and delay, and because it appeared to the Commission, on investigation, that, to a large extent, similar kinds of electrical conductors could be successfully operated by different companies in the same subway, and that better results would be attained by taking up separately each separate locality, and providing therein for the requirements of the different service in use and prospective, it was decided to construct a general plan, the idea of which is as follows:

GENERAL PLAN OF THE BOARD.

A comprehensive system of underground conduits suitable for the practical use of companies operating electrical conductors, and wherein electrical conductors may be operated without diminishing the efficiency of their service, and affording protection to said electrical conductors from deleterious influences external to said conduits the material, form, size and position of said conduits to be determined by the particular service and locality for which they are designed; the said system to be so designed and constructed as to afford accommodation, on fair and impartial terms, to all companies and others duly authorized to make use of the same, affording the

greatest possible convenience for placing, removing, repairing, altering and connecting said conductors, combined with the least possible interference with the other uses to which the public streets and highways of the City of New York are subject, said system to be in a manner used and controlled so that fair and impartial treatment of all companies and others authorized to operate electrical conductors may be assured, and the greatest safety and efficiency attained.

MODE OF CONSTRUCTION.

The Attorney-General furthermore stated to the Commission that the general plan might be constructed either by contract with a corporation or private person, or, in the discretion of the Commissioners, by labor employed by themselves. It was manifestly impossible for the Commissioners to employ labor themselves to construct the conduit into which they were to compel the introduction of electrical conductors, and the only course left open to the Board was to contract with such corporation or private person as it might be able to find willing to furnish the capital required to complete the work on terms as advantageous as possible to the City of New York and to the companies who were to use the subway after its completion.

Counsel was employed and called upon to report generally as to a company to lay, operate and maintain the subway under the direction and control of the Commission, and to suggest to the Commission all necessary legal precautions and safeguards, with a plan of contract to be made by the Commission with such company, which plan, before it was adopted by the Commission, was to be submitted to the Attorney-General for his official criticism.

ADVICE OF COUNSEL.

Counsel reported to the Board that in following out the course laid down by the Attorney-General and constructing the subway by contract with a private corporation or person, the Commission could not bind either the City, the State or the electrical companies to pay for the subway, and that the only valid consideration which it was possible to proffer to such company or private person as should be willing to provide capital to build the subway, was the exercise of the compulsory power vested in the Board which enabled the Board to compel the electrical companies to use the subway after it was completed.

As to the necessary legal precautions and safeguards in the government of the company which was to build the subway, the advice of counsel was so explicit that the Board deems it not inadvisable to incorporate it in this report.

"In a general way," said counsel to the Board, "it may be said that there are four parties in interest in this matter.

- (1.) The People.
- (2.) The Commission.
- (3.) The companies operating electrical conductors.
- (4.) The company which will act as agent for the Commission in carrying out the will of the People.

The interest of the first named, the People, is plainly indicated in the Act and identical with the duty and interest of the Commission, viz:

That the wires shall be placed underground speedily, safely, without expense to the people or the Commission, without deteriorating from the efficiency of the electrical service as it is at present.

The interest of the companies is bounded by the cost and trouble of changing from an overhead to an underground system, of maintenance when so changed, in securing such facilities as they may need on fair and impartial terms, and in being guaranteed against interference with their conductors and the impairment of their efficiency.

The interests of the constructing company is in securing a fair return for the investment made in carrying out the plan of the Commission for the laying, operating and maintaining the subway.

It may safely be said that if the Commissioners can provide satisfactorily for

- (1.) The proper laying of the subway,
- (2.) The proper allotment of spaces within it,
- (3.) The proper adjustment of rentals,
- (4.) The proper supervision of wires and freedom from interference,
- (5.) The proper protection from lawsuits,
- (6.) The proper security of carrying out the agreement and
- (7.) The proper adjustment of disputes,

they will amply protect the rights and interests of the people, the electrical companies and themselves, while all other points, such as the cost of the subway, and the government of the company in its own affairs, not conflicting with the points noted, may be left to the company itself for its own protection.

It does not make the slightest difference to the public or the electric companies or the Commission who the constructing parties are, provided their security is ample—nor how much the subway costs, provided it is laid satisfactorily and honestly—nor how much the company makes on its investment, provided the charges are properly regulated and reasonable—nor where it buys material, provided the material bought is up to the standard, and the City and Commission are protected from responsibility—nor how much space is rented to any company using electrical conductors, provided every other such company can get what space it desires—nor how often or how much one company changes or repairs its wires, provided it does not, in so doing, interfere with the wires of some other company.

The Commission in adopting a general plan for laying the subway, have adopted, with excellent reason, the principle of retaining in their own hands the power to adjust the details of their plan to the circumstances of cases which will arise as the work is going on; and, following their example, I have considered that the most satisfactory provision which could be made for disposing of the important questions arising in the relations between the Commission and the construction company and the electric companies would be to leave in the hands of the Commission and their successors such power of moderation and adjustment as will make it clearly impossible for any action to be taken by the construction company unfair to the companies or to the people.

In the matter of constructing the subway, the plan of contract I have prepared

provides distinctly that it shall be done in accordance with the plans and specifications furnished by the Commission, and this extends to every detail, and provides for every change of plan the Commission deem advisable. It will, therefore, still pertain to the Commission to see that the subway is properly and honestly laid, and, if it is not, the supervising authority will be responsible.

In the matter of allotment of spaces, the contract distinctly provides against partiality or monopoly.

In the matter of rentals, the contract provides that they shall be subject to revision by the Commission, and so, without the connivance of the Commission, no extortion is possible. And such rentals are not to be more than the cost of maintaining overhead wires, as it at present prevails.

In the matter of supervision of wires and freedom from interference, the contract provides amply and in a way that cannot be questioned.

In the matter of security from and responsibility for lawsuits, provision is also made, and it is further provided generally as to disputes between the construction and electrical companies—as to the successors of the Commission, if their term of office is allowed to expire, and as to all necessary points to be provided for.

Finally, although it is not in any way obligatory upon the Commission to provide that the City shall receive any benefit from the subway, except that of having space provided for. City wires, free of charge, and the spirit of the contract is rather that where the construction company would receive more than a fair profit on its investment, such excess should be either its own or inure to the companies by a reduction of the rate of rental, still, in case unusual profit should accrue to the company in any year by reason of the rental not being so reduced, it is made part of the contract that the City, the electric companies and the construction company shall divide all excess over ten per cent. net on the capital invested by the construction company.

The contract submitted to the Board by its counsel, after having been approved as to form by the Attorney-General, was approved by the Board as the one which the Board was prepared to enter into with any responsible company which might be willing to assume its obligation.

SELECTION OF A CONSTRUCTION COMPANY.

This was publicly announced and well understood, and five companies presented their applications to the Board and stated their willingness to undertake the work. After investigation of these companies, made by the counsel to the Board, particularly as to their relative financial abilities, the Consolidated Telegraph and Electrical Subway Company was selected as the servant of the Commission for the construction of the subway, and a bond was given to the Commission by the company in the sum of \$500,000 for the faithful performance of the contract, and to guarantee the Commission and the City against any liability incurred in the construction of the subway.

BEGINNING WORK.

General plans and specifications for the excavation, repaving and refilling of the streets were adopted and filed with the Department of Public Works, and a particular specification for a conduit suitable to the service, and ample to accommodate present

and future needs, on one of the streets of the City most used for electrical conductors, namely, Sixth avenue, were passed upon by the Board.

The contracting company was authorized and directed to begin the work of construction of the subway upon this particular street, and before the setting in of cold weather, two miles of an asphaltic concrete drawing-in-and-out conduit, capable of containing 2,500 miles of wire, were built from 21st to 59th streets.

Owing to unavoidable delays in the preparation of cables for this conduit, there are as yet working within it but six miles of wire, which belong to the Fire Department of the City of New York, and which are said to give perfect satisfaction. Six cables, each containing one hundred wires, are, however, now being placed in the structure, and it is anticipated that within a very short time this underground system will take the place of that now being operated overhead in the same locality.

OUTLOOK FOR THE COMING SEASON.

The Commission has been busily engaged during the fall and winter months in preparing for the construction on a larger scale in other streets of the City of conduits, the form and material for which will be adapted to the particular location and service for which they are designed, and with the return of suitable weather it is expected that satisfactory progress will be made in this direction.

The different electric light companies in the City have made application to the Commission for the construction of conduit covering about fifty miles of street, and the telegraph and telephone companies have signified their desire for the accommodation of about twenty thousand miles of wire.

Plans and specifications have been adopted, and an order given for the construction, as soon as the weather is suitable, of subways, as follows:

From Broadway and Vesey street, through Park Row to the Brooklyn Bridge, about a quarter of a mile, to accommodate three thousand, six hundred conductors.

From Broadway and Cortlandt street to the Produce Exchange and vicinity, about three miles, to accommodate six hundred conductors.

From Broadway and Canal street to West and 14th streets, about two and one-half miles, to accommodate twenty-five hundred conductors.

From First avenue, along 58th street to Tenth avenue, one and one-half miles, to accommodate twelve hundred conductors.

PERMITS.

During the time that the Board has been engaged in perfecting its plans, and pending the construction of subways, the natural increase in the business of the electrical companies, and the necessary repairs to their existing lines have rendered it imperative that the companies should both renew and add to their overhead systems.

It has been found expedient, in order that the local authorities might be advised as to whether this construction was by the authority of the Commission or in derogation thereof, to issue permits authorizing such repairs and extensions pending the providing of underground accommodations.

Besides these permits, several others, allowing a deviation from an underground

system in cases where the public interests do not require an underground system, or where it has been deemed impracticable by the Board to successfully operate conductors underground, have been granted, and copies thereof filed in the office of the Mayor, as is provided by law.

Regarding the first class of permits, those which are granted merely temporarily during the construction of underground accommodations, it is only necessary to say that the Board does not deem it to be the spirit of the law that the business of the electrical companies and the efficiency of their service should be impaired by or during the change from overhead to underground systems.

Regarding the other class of permits, they have been and will continue to be granted by the Board, only after careful investigation and for reasons which seem to satisfy the requirements of the Act under which they are permissible.

CABLES ON THE ELEVATED ROADS.

One company operating electrical conductors, viz.: the Western Union Telegraph Company, possesses a contract with the Manhattan Elevated Railroad Company, by which the Telegraph Company is entitled to carry its wires upon the structure of the other company, and under this contract, during the summer of 1886, two cables, each containing nineteen electrical conductors, were placed upon the elevated structure in Third avenue without the consent or approval of the Board. The Telegraph Company, however, subsequently applied to the Board for permission to maintain these cables, and it appearing to the satisfaction of the Board that if such permission were granted many of the poles and wires along the line of the elevated structure could be removed and the service provided for in a manner much more in conformity with the spirit of the Act than the continuance of the old pole lines, the Board deemed it advisable to allow those cables to be maintained until such time as underground accommodations should be provided, and, on the company agreeing to remove its poles and wires from the surface of the streets, such permits were issued. Subsequently permits were granted for the placing of other similar cables upon the elevated structure in Ninth avenue, the company agreeing to remove its poles and wires; the Commissioners authorizing the cables on the elevated structure only pending the construction of underground accommodations for the same.

LEGAL COMPLICATIONS.

The enforcement of the law relating to electrical conductors in the City of New York has occasioned considerable opposition.

The first met with was in the illegal extension and renewal of overhead systems without the consent and approval of the Board. Prompt action on the part of the local police authorities, when they were applied to, checked and put an end to this sort of evasion. After a few arrests had been made, and when it was found that the Board was disposed to grant temporary privileges wherever there seemed to be proper occasion, this trouble entirely ceased.

Following this, attempts were made by two different companies, organized many years ago for the purpose of operating electrical conductors underground, to construct and operate conduits without the approval of the Board of their plans, and without compliance with the provisions of the law, and in one instance an attempt was also made by the New York Electric Lines Company to prevent the Commission from con-

structing that part of its general plan devised for Sixth avenue, under a claim that a certain portion of the subsoil of Sixth avenue belonged to the said company, and that the occupation of that part of the street by the Commission was an irreparable injury to the rights of the company.

In most of the litigation attendant upon this opposition the Board and local authorities have been successful.

The constitutionality of the law regulating the operation of electrical conductors in the City of New York, though several times questioned, has not been denied, and it has always been decided that companies operating electrical conductors desiring or being required to place the same underground must conform to the Act of 1885, and gain the approval of the Board of their plans of construction. In a suit brought by the Board to restrain the New York Underground Telegraph Company from carrying out its publicly expressed intention of making excavations for the purpose of operating electrical conductors underground, until such time as the said company's plan of construction should be submitted to and meet with the approval of the Board, however, one of the learned Judges of the Court of Common Pleas has decided that the Commission is acting without authority of law in constructing through a servant company a general system of subways; that it has no authority to compel the use thereof, and that its attempt to do so is an attempt to create a monopoly.

It would seem to be necessary, therefore, for the Legislature to interpret, in some manner, the Act of 1885, and indicate whether the construction of it rendered by the Attorney-General and acted upon by the Board or that of the learned Judge of the Common Pleas, is to be followed, if the work of the Commission is to be carried on and completed. It is unnecessary for the Board to discuss the legal questions involved here, as the Commissioners have been wholly guided in this matter by the Attorney-General and their own counsel.

TIME NECESSARY TO COMPLETE WORK.

Should the Legislature indicate its approval of and acquiescence in the work of the Commission, or provide in any other way for the placing of the electrical conductors underground, it will be impossible for the work of constructing subways to accommodate them to be completed before the 1st of November, 1887, on which day this Board will expire by limitation.

The feeling of the Commissioners, very naturally, is that the Board should be continued until such time as its work can be accomplished. The Board is not of the opinion that it has been dilatory or remiss in beginning or carrying on the work entrusted to it, but believes that any one who conscientiously examines into the conditions of the problem to be solved in this matter, in the City of New York, the difficulties to be met with, and the great number and extent of the conductors to be provided for, will be thoroughly satisfied that the work is one of great magnitude, not to be undertaken hastily, and not to be finished within the short space of two years. By the time that the Commission legally expires, even if the best progress is made during the coming season, and all the doubts and difficulties now surrounding the work are cleared away, scarcely more than a beginning will have been made. A careful estimate of the mileage of the electrical conductors to be provided for, places it at more than three times that of the present overhead systems, or something like fifty thousand miles.

It is reasonable to expect that one-third of these will have been provided for by the first of November, 1887. This will leave much still to be done.

If the terms of office of the Commissioners should be extended for such time as would enable them to practically complete the work intrusted to them, after that the supervision of the electrical conductors and conduits might well be left to the local authorities, or to a single-headed commission, or to such a State Board of Electrical Commissioners as has been proposed, but until the greater part of the work is completed, if the Commission is allowed to expire there will be danger of its not being finished.

EXPENSES OF THE COMMISSION.

The Board has been somewhat hampered and much inconvenienced by the failure, on the part of the Comptroller of the State, to meet its necessary and incidental expenses. The magnitude of the work of the Board, the many scientific and mechanical questions involved, the vast amount of testimony heard and inquiry made, the opposition encountered and the necessity for thorough inspection and supervision of the construction undertaken, have necessitated the occupation of offices, the procurement of furniture and stationery, the printing reports and forms of permits, the employment of engineers, scientific experts, counsel and clerks.

It has been the opinion of the Board, and of its adviser, the Attorney-General, that it was constitutional for something more than the mere approval of plans submitted to it, and that the failure to submit suitable plans made it obligatory upon us to construct subways and place the electrical conductors within them. The Board has viewed the obligation imposed upon it as a great one, and one to be fulfilled in the best and most enlightened manner possible. While the Board knows of no instance in which it has been extravagant or reckless in its expenditure, it has not deemed it necessary to be without information or convenience or advice which has seemed essential or advantageous, simply because of the attendant expense. Many obligations have been incurred by the Board considered necessary or incidental to its work, and none of these have as yet been satisfied.

In conclusion, the Board respectfully submits that it can hardly be a matter of regret that the failure on the part of the electrical companies to place their conductors underground has resulted in the perfection of a plan by which the desired results, so far as the public is concerned, can be most satisfactorily attained, while at the same time the obligation of the company constructing the subway being such as to render it at all times subject to the control of the Board and its successors, makes it in effect a public work controlled by public officers available by all entitled to operate electrical conductors on impartial terms and, without costing the people of the City or the State a single dollar, a probable source of income to the City.

The Board believes that short of the construction of the subway by the City and its direct ownership by the public, no method for its construction could be found so good as the one adopted, and it is possible that as far as the electrical companies are concerned not even the course alluded to would be preferable.

(Signed),

JACOB HESS,
THEO. MOSS,
DANIEL L. GIBBENS,

Commissioners.

No. 1218 Broadway, New York, February 4, 1887.

FORM OF CONTRACT.

This agreement, made this day of July, 1886, by and between Roswell P. Flower, Jacob Hess and Theodore Moss, as Commissioners, under and by virtue of an Act of the Legislature of the State of New York, being Chapter 499 of the Laws of 1885, passed June 13, 1885, as amended by Chapter 503 of the Laws of 1886, passed May 29, 1886 (acting for themselves and for and in behalf of the Mayor, Aldermen and Commonalty of the City of New York, and the People of the State of New York), parties of the first part, and Company, a corporation and duly organized and existing under and by virtue of the laws of the State of New York, party of the second part,

Whereas, The said parties of the first part are authorized by said Act, as amended, to cause to be devised a plan for the placing underground of all electric conductors in the City of New York, and to carry the same into operation and effect; and

Whereas, The said party of the second part is willing and desirous to act as servant of said parties of the first part in carrying the purposes of said Act into effect, now

Therefore, this agreement witnesseth, that in consideration of the premises and of the mutual promises and agreements herein contained and of the sum of one dollar by each to each of the parties hereto in hand paid, receipt whereof is hereby acknowledged, the parties hereto agree as follows:

I.

The party of the second part agrees to furnish the capital necessary to build the subways herein contemplated, not less than million dollars, and will build, equip, maintain and operate the same as herein provided.

II.

The management of said subway and the rental of spaces thereof shall be with the party of the second part, but such management and rental shall at all times be wholly subject to revision, alteration, amendment, and reversal by the parties of the first part and their successors, but the parties of the first part and their successors shall not interfere in such management or rental except for the purpose of more fully carrying into effect the intent of this agreement or of the laws of this State, or of the ordinances of the City of New York. And to further the intent hereof, the party of the second part shall keep in regular books for that purpose full and accurate accounts of

1st. The amount of space in said subways occupied, with the names of those so occupying it.

2d. The number and kind of electric conductors therein, with the names of the owners thereof.

3d. The gross and net amount in detail of rental and charges of all kinds collected by the party of the second part with the names of the persons, corporation or association paying the same.

4th. All expenditures, payments and outlays of every kind (whether commis-

sions, allowances, if any or otherwise) made by the party of the second part, in detail, with the names of those to whom the same are made.

And said books and accounts, and all the books, papers and writings of the party of the second part, shall at all times be open to inspection by the parties of the first part and their successors, who may take full copies thereof.

III.

The subways herein contemplated shall be built by the party of the second part in accordance with the plans and specifications to be furnished by the parties of the first part, which subways shall at all times be kept in good repair by and at the cost of the party of the second part who will adopt, subject to the approval of the parties of the first part and their successors, any and all improvements that will increase the usefulness and efficiency of the system contemplated by the act hereinabove referred to. The parties of the first part and their successors shall have at all times the right to make such modifications and changes as experience shall show to be desirable, either in the plans and specifications, the construction of the subway, the material to be used, and all other matters in connection with said construction.

IV.

The party of the second part shall, at its own cost, furnish to the parties of the first part, any and all maps, working and other plans, profiles, surveys and drawings made to scale or otherwise, and all accessible data, figures and information, that may be requested by the parties of the first part, and necessary, or deemed so to be, for the purposes hereof, and shall also reimburse the parties of the first part for all expenses incurred by them in superintending and inspecting the construction of said subways.

V.

The spaces in said subways shall be leased by the party of the second part to any authorized company operating, or intending to operate, electrical conductors in any street, avenue or highway in the City of New York that may apply for the same.

No space not actually needed for occupation by its electrical conductors in the due conduct of its business, shall be leased to any company to the exclusion or detriment of any other company needing space in said subways, and desirous and able to pay for the same.

The said party of the second part shall, without charge, supply to the City of New York all space in said subways necessary for its electric conductors, and the electrical conductors of each separate department of said city.

If at any time the space in such subways shall not be sufficient for all companies so applying for the same, such space shall be provided as shall be so needed by the party of the second part, at its own cost, subject to the approval of the parties of the first part, and their successors, as in the original construction.

VI.

The rent to be collected by the party of the second part from any company occupying by electrical conductors, space in said subway, shall not exceed the present cost of maintaining such conductors. But this shall not prevent the making of any contract

between the said party of the second part and companies operating electrical conductors on any terms which may be mutually agreed upon, subject to the approval of said parties of the first part, and their successors.

The party of the second part may fix a fair scale of rents to be charged, according to the kind of conductors and the amount of space required, which rents shall be at the same rate to all occupants, and whenever the net annual rental from said subways, after paying charges and expenses, shall exceed ten per cent. of the value of the capital invested by the said party of the second part, the excess above said ten per cent. shall be paid one-third thereof to the City of New York, one-third thereof to the companies occupying said subways and paying rent thereof, *pro rata*, and one-third to be retained by the party of the second part.

VII.

All companies occupying space in said subways shall own their own conductors and shall have the full management and control thereof, except where otherwise mutually agreed upon by said party of the second part and said companies, subject to the approval of the said party of the first part and their successors, but said management and control shall be subject to the rights of all other occupants of said subways, and to such reasonable rules and regulations as may be made by said party of the second part. All maintenance and repairs of such conductors shall be done by the company owning them, under the supervision of the party of the second part, who shall prevent injury to the conductors of other occupants, and shall guarantee safety to all.

VIII.

In case any dispute shall arise between the party of the second part and any company occupying, or desiring or required to occupy said subways, the same shall be referred to the parties of the first part, and their successors, for settlement, whose decision shall be final.

IX.

The parties of the second part shall give a bond to the parties of the first part in the penal sum of half a million dollars, with good and sufficient sureties, satisfactory to the parties of the first part, securing the just and full performance of this contract and the building of said subways as herein provided, and securing said parties of the first part, and their successors against any and all patent, and other suits arising from the building and operation, use and maintenance of said subways. But, as the expense of compelling owners of overhead wires to enter said subways is properly one falling upon said parties of the first part, and as said expense can, with others, be collected from said owners of overhead wires, all such expense incurred in compelling said owners of overhead wires to go into said subways shall, in the first instance, be borne by said parties of the first part and their successors.

The said bond shall also be a guarantee to the City of New York for any and all damage to the said city by reason of the construction of said subway, and shall be a guarantee to said city that said party of the second part shall replace the pavements of said city, and other property of said city, removed in the course of said construction in the same manner and condition as before said removal, and shall in no wise injure the said pavement or other property.

X.

If at any time in the opinion of the parties of the first part, or their successors, there shall be a substantial failure by the party of the second part to fully carry out the provisions of this agreement, and it is so adjudged by competent judicial authority, the parties of the first part and their successors may enter into the possession and control of said subways, and make such disposition thereof as may be lawful, and the parties of the second part shall thereupon cease to have any interest or property in such subways, and will quietly and peaceably surrender the possession and control thereof to the parties of the first part and their successors.

XI.

The parties of the first part hereby grant to the party of the second part, subject to the approval of the proper officers of the City of New York, as provided in said Act of 1885, the right to build subways in accordance with such plans and specifications as shall at any time be furnished by the parties of the first part, who hereby agree to use all lawful means in their power to compel all authorized companies or persons using electrical conductors to comply with said law, and to place their conductors in said subways, and to pay a fair rental for the space occupied therein; but the parties of the first part and their successors shall not be responsible for any failure therein.

XII.

The successors of the parties of the first part shall be construed to include those who may succeed them as Commissioners prior to the first day of November, 1887, and those appointed by or under any law amending said law, or by or under any law hereafter passed by the Legislature of the State of New York, or any official of the City of New York, succeeding to the powers, or any of them, or said parties of the first part, or any other person or persons succeeding to said powers.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands and seals the day and year first above written.

In presence of

A report of the expenses of the Board for the past three months, amounting to \$20,431.84, was, on motion duly seconded, ordered to be sent to the Comptroller as the current expenses for the quarter.

On motion of Commissioner Hess, the report submitted by Commissioner Gibbens was ordered that same be adopted as the report of the Commissioners; that same be printed in pamphlet form with a form of contract as an appendix.

On motion duly seconded it was resolved, That 500 copies be printed in pamphlet form and sent to members of the Legislature, etc.

Meeting adjourned subject to call of the Chair.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Saturday, February 26, 1887, at three p. m. Present: Commissioners Hess, Gibbens and Moss.

Reading of the minutes of the previous meeting was, on motion, dispensed with.

Application from the Baltimore and Ohio Telegraph Company to string four aerial cables from No. 63 Broadway to Broadway and Canal street, via West Broadway, Hudson, and including poles on Lispenard street was referred to engineer to examine and report, and the application would be taken up and acted on at the first meeting after March 15.

Application of the Metropolitan Telephone and Telegraph Company for cable of thirty-eight wires, Cortlandt street to West street, to Seventh avenue and 11th street, was granted.

The construction company was ordered to suspend all work ordered by this Commission until further notice.

Charles A. Hess, attorney for the Commission, was directed to proceed with the suit against the New York Underground Telegraph Company.

Engineer of the construction company reported that his company was ready with all material on hand to proceed with the work laid out as soon as the Commission gave them permission to do so.

On motion, Mr. Andrews was substituted in place of Mr. Gibbens as attorney in the suits of the New York Electric Lines Company against this Commission.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Monday, March 14, 1887, at three p. m. Present: Commissioners Hess, Gibbens and Moss.

Reading of the minutes of the previous meeting was, on motion, dispensed with.

Metropolitan Telephone Company, by Gen. Huidekoper, asked permission to abandon several downtown stations and to carry new cables over housetops to their new building on Cortlandt street (see letter of 14th inst.), which was granted.

In the matter of the Baltimore and Ohio Telegraph Company application made at the last meeting, the engineer, Col. Kearney, reported that he had been carefully over the route suggested and thought it was the best that could be selected.

[MARCH 31, 1887.]

On motion the necessary permit was ordered to be granted, as it is impossible to furnish underground accommodation in the present condition of affairs. Commissioner Gibbens was requested to draw up the necessary permit and to file copy of same with the Mayor.

Notice received from the Department of Public Works about water running into the cellar at No. 896 Sixth avenue was referred to the construction company, with directions to attend to the same.

Application of the Safety Electric Light and Power Company laid on the table to be considered at some future meeting.

Adjourned.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, Thursday, March 31, 1887, at eleven o'clock. Present: Commissioners Gibbens and Moss.

Commissioner Gibbens in the Chair.

On motion, duly seconded, it was resolved that the permit granted to the Baltimore and Ohio Telegraph Company, at the last meeting of the Board, be recalled, and the following permit granted as a substitute:

OFFICE OF

THE BOARD OF COMMISSIONERS OF ELECTRICAL SUBWAYS,

1218 Broadway.

NEW YORK, March 23, 1887.

Whereas, The Board is satisfied, by investigation, that it is not practicable, at present, to operate conductors of the Baltimore and Ohio Telegraph Company underground; and that, owing to the fact that the removal of the office of the said company requires connection to be made between the present office, and that to which removal is contemplated; therefore, be it

Resolved, That permission be granted to the Baltimore and Ohio Telegraph Company to erect a structure to carry electrical conductors as follows: Twenty-five poles with the necessary fixtures in Lispenard, Beach, Washington and Rector streets, said poles to be about 150 feet apart, about 60 feet in height, and about 18 inches in diameter; situated upon the sidewalk close to the curb.

Permission is also granted to stretch four (4) aerial cables from No. 63 Broadway to Broadway and Canal street, via Rector, Washington, Beach and Lispenard

streets; said cables to be placed along said streets on poles now standing and the twenty-five contemplated poles, as above.

This permit is granted subject to all the rules and regulations of the local authorities, and the privileges accorded are merely temporary, pending the providing of underground accommodations, or the further order of this Board; and a copy hereof is to be filed in the office of the Mayor of the City of New York according to law.

For the Board.

Secretary.

The Secretary will transmit copy of permit and resolution to the Mayor.

Adjourned subject to call of the Chair.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Tuesday, June 14, 1887, at eleven o'clock.
Present: Commissioners Hess, Gibbens and Moss.

On motion, reading of the minutes of the last meeting was dispensed with.

The following agreement was then read. After the reading Commissioner Gibbens moved that the contract as read be signed by the Commissioners and duly executed this day. The motion was duly seconded and carried, all voting aye.

This agreement, made this 7th day of April, 1887, by and between Jacob Hess, Theodore Moss, Daniel L. Gibbens, as Commissioners, under and by virtue of an Act of the Legislature of the State of New York, being Chapter 499 of the Laws of 1885, passed June 13, 1885, as amended by chapter 503 of the Laws of 1886, passed May 29, 1886, parties of the first part, and the Consolidated Telegraph and Electrical Subway Company, a corporation duly organized and existing under and by virtue of the Laws of the State of New York, party of the second part.

Whereas, The said parties of the first part are authorized by said act, as amended as aforesaid, to cause to be devised a plan for the placing under ground of all electrical conductors in the city of New York, and to carry the same into operation and effect; and

Whereas, The making of this contract is deemed advisable and proper for the purpose of accomplishing the ends intended and provided for by this act, and the execution of the duties imposed thereby upon the said parties of the first part; now

Therefore, this agreement witnesseth that in consideration of the premises and of the mutual premises and agreements herein contained, and of the sum of one dollar by each to each of the parties hereto in hand paid, the receipt whereof is hereby acknowledged, the parties hereto agree as follows:

I. The party of the second part hereby agrees to provide, build, equip, maintain and operate, as herein provided, the subways in this contract mentioned and referred to.

II. The subways aforesaid shall be built in accordance with the plans and specifications therefor furnished or to be furnished by the parties of the first part, or their successors, and the same shall be provided, built, equipped, maintained, operated and kept in good repair by and at the cost of the party of the second part, who will, upon the reasonable demand of the parties of the first part, or their successors, adopt any and all necessary improvements that will increase the usefulness and efficiency of the system contemplated by this contract and the act above referred to. The parties of the first part and their successors shall have the right at any time to make such modifications and changes as may be reasonably necessary in the said subways or any of them or the construction, plans, material or any other matter connected with them or any of them, or with the construction, maintenance or operation of them or any of them, and the party of the second part shall conform to and carry out any changes or modifications so made.

III. The party of the second part shall, at its own cost, furnish to the parties of the first part, and their successors, any and all maps, working and other plans, profiles, surveys and drawings, made to scale or otherwise, and all accessible data, figures and information that may be requested by said parties of the first part, or their successors, and necessary, or deemed to be so, for any purpose relating to or connected with said subways, or the duties of the said parties of the first part, or their successors, in connection therewith or relation thereto, and shall also reimburse the parties of the first part, or their successors, for all reasonable expenses incurred by them in superintending and inspecting the construction of said subways.

IV. The spaces in said subways shall be leased by the party of the second part to any company or corporation having lawful power to operate electrical conductors in any street, avenue or highway in the city of New York that may apply for the same, including any company or corporation having, or which shall acquire, lawful power to manufacture, use or supply electricity.

No space not actually needed for occupation by its electrical conductors in the due course of its business shall be leased to any company or corporation to the exclusion or detriment of any other company or corporation needing space in said subways and desiring and able to pay for the same.

The said party of the second part shall, without charge, supply to the City of New York all space in said subway necessary for its electrical conductors and the electrical conductors of each separate department of said city which may now or hereafter be required.

If at any time the space in such subways shall not be sufficient for all the companies or corporations so applying for the same, or for the City of New York or any of its departments, the additional space needed shall be provided by the party of the second part, at its own cost, by the construction, maintenance, equipment and operation of additional subways sufficient therefor, subject, however, to the same conditions and the same control by the parties of the first part, or their successors, as the original subways are by the terms of this contract and by any law.

V. The party of the second part may fix a fair scale of rents to be charged according to the kind of conductors and the amount of space required therefor, which shall be at the same rate to all occupants making a like use of said subways, but the

scale of rentals or any charges fixed or made by the party of the second part shall at all times be subject to the control, modification and revision of the parties of the first part, or their successors; and no contract shall be made between the party of the second part and any company or corporation on any terms which shall not require the payment by such other company or corporation of rents at the rates so fixed.

VI. Whenever the net annual profits of the party of the second part, remaining after the payment of the expenses of maintaining and operating such subways, shall exceed ten per cent. upon the actual cash capital invested by it in providing, constructing and equipping such subways, then the excess of such profit over the ten per cent. shall be paid into the Treasury of the City of New York; but if in any year or years prior to the earning of such excess the earnings of the party of the second part shall not have equaled ten per cent., then the party of the second part shall be first entitled to recoup itself out of such excess for the difference between the actual annual earnings and the said ten per cent., the intention hereof being that no payment shall be made to the City of New York out of such excess of earnings until the party of the second part shall first have actually earned and received ten per cent. for each year theretofore. And the party of the second part shall and will at all times keep just full and true books of accounts which shall show in detail the transactions had by it, and with whom the same were had, and the nature thereof, and especially

1. The amount of space in said subways occupied, with the names of the occupants thereof and the respective amounts of such space occupied by each occupant.

2. The number and kind of electrical conductors therein, with the names of the owners and users thereof.

3. The gross and net amount in detail of rentals and charges and moneys of all kinds collected or received by the party of the second part, and from whom and for what the same were received or collected, specifying the names of those paying such moneys, and the cause or consideration of such payments in detail.

4. All payments of every kind made by the party of the second part, specifying in detail and separately each payment and to whom the same was made and the cause or consideration thereof, so as to show specifically the nature thereof, so that it may be determined whether the same is chargeable to the cost of construction or of maintenance.

And said books and accounts, and all the books, accounts, papers and writings of the party of the second part shall at all times be open to the inspection of the parties of the first part, or their successors, and of the Comptroller of said city, or any person or persons by him or them deputed to examine the same, and they or he may copy the whole or any part thereof.

And said party of the second part shall and will on the first day of October of each year, make and return a statement to the Comptroller of the City of New York, in such form and verified as he may require and prescribe for the year ending the next preceding first day of September. And any moneys payable to the city under this clause of this agreement, by the party of the second part, shall be paid annually on the first day of November.

VII. The party of the second part shall not open any street surface without first obtaining a permit therefor from the Commissioner of Public Works, or other officer

or department of said city vested by law with the control of the surface of the street to be opened, and giving to him or it such an agreement as he or it may approve and require for the proper restoration of the pavement of said street and the surface thereof, and for keeping the same in repair for one year after the same has been so replaced or restored.

VIII. The party of the second part shall not be deemed to be the servant or agent of the parties of the first part or their successors, or of the Mayor, Aldermen and Commonalty of the City of New York in doing any act under or in execution or performance of this contract, but shall be deemed to be, and is hereby intended to be made and dealt with by the parties of the first part and their successors, and all persons whomsoever as an independent party contracting with the parties of the first part, and their successors and others, and having and acquiring such rights for itself as this contract secures to it.

IX. All companies occupying space in said subways shall own their own conductors, and shall have the full management and control thereof, except where otherwise mutually agreed upon between the said party of the second part and said companies, subject to the approval of the parties of the first part or their successors; but said management and control shall be subject to the rights of all other occupants of said subways, and to such reasonable rules and regulations as may be made by the said party of the second part. All maintenance and repairs of such conductors shall be done by the company owning them, under the supervision of the party of the second part, who shall prevent injury to the conductors of other occupants.

X. In case any dispute shall arise between the party of the second part and any company occupying or desiring or required to occupy said subways, the same shall be referred to the parties of the first part, or their successors, for settlement, whose decision shall be final.

XI. The party of the second part shall give a bond to the parties of the first part, and their successors, in the penal sum of two hundred and fifty thousand dollars, with good and sufficient sureties satisfactory to the parties of the first part, or their successors, securing the just and full performance of this contract, and the building, or providing of said subways, as herein provided, and securing said parties of the first part, and their successors, and the Mayor, Aldermen and Commonalty of said city, well and safely against any and all patent and other suits arising from the building and operation, use and maintenance of said subways, or of any subways provided by the party of the second part, whether the same now are or shall hereafter be built by it, and in the case of the insolvency or death of either of the sureties upon such bond, the party of the second part will, upon the request of the parties of the first part, or their successors, give a new bond of the same tenor and effect, and subject to approval, the same as the bond so originally to be given. The said bond shall also contain a guarantee to the City of New York for any and all damages to said city by reason of the construction of said subways. Any and all provisions contained in the subdivision or clause marked IX. of the agreement between Roswell P. Flower, Jacob Hess and Theodore Moss, as Commissioners, under the acts aforesaid, and dated the 27th day of July, 1886, and not in this agreement contained, are hereby revoked and canceled.

XII. If at any time, in the opinion of the parties of the first part or their successors, there shall be a substantial failure by the party of the second part to fully carry out the provisions of the said agreement dated the 27th day of July, 1886, as

amended and modified by this agreement, and it is so adjudged by competent judicial authority, the Mayor, Aldermen and Commonalty of the City of New York may enter into the possession of said subways, and the party of the second part shall, subject to any valid mortgages or liens then thereon outstanding, not exceeding fifty per cent. on the actual cost of such subways, and all leases or contracts then existing for the use thereof as hereinbefore provided, forfeit its interest in such subways, and will quietly and peaceably surrender the possession thereof to the Mayor, Aldermen and Commonalty of the City of New York, who shall thereupon and thereafter hold and own the same, subject, however, to the same powers and duties of the parties of the first part, or their successors, as the same would otherwise have been held subject to by the party of the second part, and the same, until otherwise provided by law, shall be maintained and operated by the said Mayor, Aldermen and Commonalty of the City of New York by and through the parties of the first part, or their successors, subject to such lawful liens, mortgages, leases and contracts.

XIII. The parties of the first part hereby grant to the party of the second part the right to build subways in accordance with such plans and specifications as shall at any time be furnished by the parties of the first part, as hereinbefore provided, and said parties of the first part hereby agree to use all lawful means within their power to compel all authorized companies or persons using electrical conductors to comply with the provisions of law and to place their conductors in said subways and to pay a fair rental for the space occupied therein, but neither the parties of the first part nor their successors, nor the Mayor, Aldermen and Commonalty of the City of New York, shall be liable or responsible for any neglect or failure on the part of any such company or person so to place their conductors in said subways, or having placed their conductors therein, to pay the fair rental for the space occupied by him or it; nor shall the Mayor, Aldermen and Commonalty of the City of New York be liable for any neglect, failure or refusal in the premises of the parties of the first part, or their successors.

XIV. The successors of the parties of the first part shall be construed to include those who may succeed them as Commissioners under the provisions of existing laws, or under the provisions of any law hereafter passed by the Legislature of the State of New York, or any officer or officers of the City of New York who shall succeed to the powers and duties of the parties of the first part, or any part of such powers and duties, under the provisions of any law now existing or hereafter enacted by the said Legislature, or any other persons or officers hereafter appointed or selected pursuant to any law, to succeed to the powers and duties, or any part thereof, of said parties of the first part.

XV. The said party of the second part shall, at any time after January 1 (1897), eighteen hundred and ninety-seven, upon the demand of the Commissioners of the Sinking Fund in the City of New York, by proper instrument or instruments of conveyance or transfer, in due form and duly executed, sell, assign, transfer, convey and set over to the Mayor, Aldermen and Commonalty of said city all or any of the subways constructed by it, as aforesaid, and all or any of the contracts or other property of any kind held or owned by the party of the second part for any of the purposes of its incorporation, subject, however, to all leases, mortgages or contracts theretofore lawfully made, within the limitations imposed by section XII. of this contract, when the said Commissioners of the Sinking Fund shall request them to and for the payment for which the said Commissioners of the Sinking Fund shall provide, as provided by any law hereafter passed, but not less than the cost thereof;

and if the said company shall not have earned ten per cent. per annum on actual cost during the term of this contract a further payment shall be made, in addition to the cost, not exceeding ten per cent. on such cost, to the extent of such deficiency in annual earnings.

XVI. This agreement shall not bind either of the parties thereto, except and until it shall have been ratified and confirmed by any Act or Acts of the Legislature of the State of New York, and shall be null, void and of no effect unless and until the bond hereinbefore mentioned and required to be given by the party of the second part shall be given within thirty days after such act shall have been passed, or within such further time, not to exceed sixty days additional, as may be granted for that purpose within said thirty days by said parties of the first part or their successors.

And from and after the time when this contract shall become binding upon the parties thereto, it shall be deemed and construed to be a contract amending and modifying the agreement made by and between the Commissioners of Electrical Subways in the City of New York and the party of the second part hereto, dated the 27th day of July, 1886, and nothing in this contract nor in the contract hereby amended and modified shall be construed as granting to the party of the second part any exclusive privileges, immunity or franchise whatsoever.

XVII. This contract shall be executed in triplicate, one copy thereof to be kept and retained by each of the parties hereto and the third copy thereof to be deposited and filed in the office of the Comptroller of the City of New York, and to be a public record.

In witness whereof, etc., etc.

Application from the Harlem Lighting Company to stretch twelve new wires on four of the Fire Department poles on 122d street, between Second and Third avenues, was read, and on motion duly seconded, a permit was granted, to be signed by the Secretary when he is satisfied that the necessary permission asked by the company had been granted by the Fire Department.

Minutes of a meeting of the Board of Commissioners of Electrical Subways, held at the offices, No. 1218 Broadway, on Wednesday, June 29, 1887. Present: Commissioners Hess, Gibbens and Moss.

Reading of the minutes of the previous meeting, on motion, dispensed with.

Resolved, That the President of this Board is directed and required to turn over and deliver to the Board of Electrical Control in and for the City of New York all maps, plans, models, books and papers relating to the construction and location of electrical conductors, conduits or subways filed with or communicated to this Board, and all of the Board's official papers of any kind, immediately, and to convey the same to such place as said Board of Electrical Control may direct.

Resolved, That the President of this Board is required and directed to notify members of the Board of Electrical Control to meet in the office of the Mayor of the City of New York on or before the 5th day of July, 1887, at 3.30 p. m., or at such other place and time on or before said day as may seem to him best, for the purpose of receiving said official papers and of directing what disposition shall be made thereof.

Resolved, That the Secretary is directed to notify the landlord of these premises that the Board will not occupy them after said 5th day of July, and to make satisfactory arrangements to that end.

Resolved, That the President of this Board shall appoint a committee of one member of the Board, who shall from the books of the Board make an abstract of monies due to members of the Board and other persons for services rendered as such members and as employees of the Board, and who shall do everything in his power by conferring with the Comptroller of the State and in other ways to procure the payment of such sums due for said services to said 5th day of July, 1887.

Commissioner Gibbens appointed such committee.

Resolved, That the President of this Board is directed to convey to all employees of the Board the grateful acknowledgment of the Board of their faithful service as such employees, and to inform them that the Board will dispense with their services from and after the said 5th day of July, 1887.

Resolved, that Henry C. Andrews, Esq., and Charles A. Hess, Esq., who are at present acting as attorneys for this Board, are directed to discontinue any and all suits brought in the name of this Board against any persons, corporations and firms whatsoever, and to hold all papers belonging to this Board now in their possession as the property of and subject to the order of the said Board of Electrical Control.

Adjourned *sine die*.

F. A. LOVECRAFT, Assistant Secretary.

MINUTES
OF THE
BOARD OF
ELECTRICAL CONTROL

VOL I



Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Tuesday, July 5th, 1887, at 1.30 p. m.

Present: Acting Mayor H. R. Beckman, Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

On motion, the Acting Mayor was appointed Chairman of the meeting.

On motion of Commissioner Gibbens, duly seconded, Mr. Hess was nominated President of the Board and duly elected.

On motion, duly seconded, Mr. Moss was nominated Secretary of the Board and duly elected.

On motion, duly seconded, it was

Resolved, That the books and papers, the property of the Commissioners of Electrical Subways, which are this day turned over to this Board, remain in the custody of the Secretary, in the old offices, No. 1218 Broadway, and that those offices be retained until further action by this Board.

On motion, duly seconded, it was

Resolved, That Messenger John W. Totten be retained in the employ of this Board, at a salary of \$75 per month.

On motion, duly seconded, it was

Resolved, That Henry S. Kearney be, and is hereby, appointed the Engineer of this Board, at a salary of \$400 per month.

On motion, duly seconded, it was

Resolved, That Engineer Kearney be ready to report at the next meeting as to the locality best suited for the re-commencing of the work on the subways, and also to express his views as to the general outline of the work first necessary to be done under the direction of this Board.

On motion, duly seconded, it was

Resolved, That the President appoint a committee of one to submit to the

Board, at its next meeting, forms to be used in applying for and granting permits, with an abstract of the rules and regulations necessary to be observed in the placing of electrical conductors and the fixtures for the same.

Carried. Commissioner Gibbens appointed as such committee.

Resolved, That the Secretary write a letter of inquiry to the Western Union Telegraph Company as to the number of poles removed on Third and Ninth avenues since permission was granted them to stretch their cables on the elevated roads; also to ask within what length of time the company would be prepared to remove all poles carrying their wires now standing on that avenue.

Resolved, That as the permit granted to the Metropolitan Telephone and Telegraph Company to erect new poles on the route from 59th street and Tenth avenue to Yonkers required the taking down of the old poles, that company be requested to report how many old poles have been taken down, and, if any remain, why they have not been removed.

Resolved, That as sufficient accommodation has been provided on Sixth avenue, from 22d street to 58th street, for the accommodation of the wires of the Metropolitan Telephone and Telegraph Company, that company be notified that this Board has requested the Mayor to direct the Commissioner of Public Works to remove, at the expiration of ninety days, all poles of said company on Sixth avenue, between the streets named, unless same are soon removed by said company.

Resolved, That all companies using electrical conductors that have filed applications with the Commissioners of Electrical Subways for the erection of poles or the stretching of wires, be requested to renew the applications to the Board of Electrical Control.

On motion, duly seconded, it was

Resolved, That Mr. F. A. Lovecraft be, and hereby is, appointed Assistant Secretary to this Board, and that he be instructed to keep the following books:

First minute book, for the recording of the proceedings of this Board.

Permit book, to record all permits issued.

Two account books, one showing expenses incurred by this Board, which are chargeable to the State, and one showing expenses incurred by this Board which are properly chargeable to the Consolidated Telegraph and Electrical Subway Company.

On motion, duly seconded, it was

Resolved, That the Secretary be directed to notify the Consolidated Telegraph

and Electrical Subway Company to present at the next meeting whatever bonds are required by law to be filed with this Board.

On motion of Acting Mayor Beekman, duly seconded, the Engineer of this Board was directed to report at the next meeting, generally, in regard to the subways already constructed on Sixth avenue, the amount of accommodations afforded, etc., and also what is proposed in the matter of furnishing accommodation for electric light and power lines.

On motion, duly seconded, it was

Resolved, That the Engineer of this Board shall have access to the rooms of the engineer of the Consolidated Telegraph and Electrical Subway Company, and also to all plans, drawings and papers generally, pertaining to the construction of conduits owned or held by said company.

On motion, this Board adjourned to meet on Thursday, July 7th, at 3 p. m., at the Mayor's office.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, on Thursday, July 7th, 1887, at 3 p. m.

Present: Acting Mayor H. R. Beekman, Commissioners Jacob Hess, D. L. Gibbens and Theodore Moss.

Reading of the minutes of the previous meeting dispensed with.

Mr. Edward Lauterbach, on behalf of the Consolidated Telegraph and Electrical Subway Company, submitted a form of bond and surety for the approval of the Board, as required by law.

Commissioner Gibbens moved that a committee of two be appointed by the Chairman of the Board to pass upon this form, and make their report at the next meeting.

On motion of Acting Mayor Beekman, the resolution was amended to also have the form submitted to the Corporation Counsel for his opinion. Carried and so ordered. The Mayor and Commissioner Gibbens were appointed such committee.

On motion of Commissioner Gibbens, duly seconded, it was

Resolved, That a committee of one be appointed to file a copy of the contract with the Comptroller.

Commissioner Gibbens was appointed as such committee.

Commissioner Gibbens read a report on the granting of permits for the placing and maintaining of new wires on overhead structures, also rules and regulations in regard to overhead wires as well as of subways, a form of application for permit and a form of permit.

On motion of Commissioner Hess, duly seconded, the report and forms presented by Commissioner Gibbens were laid over for the consideration of the Board, and report to be made at the next meeting. Carried. The Mayor suggesting that the opinion of the Commissioner of Public Works be obtained thereon.

The following letter from the Metropolitan Telephone and Telegraph Company was read:

NEW YORK, July 7, 1887.

To the Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN:—I submit herewith, to be filed with your Honorable Board, a copy of the map of New York, N. Y., south of 58th street, showing the location of subway routes required to meet the needs of this company, subject to such changes in the locations of subways and number of ducts as the company may hereafter request, and I ask, on behalf of this company, that the subway routes designated may be authorized by your Board and that the Consolidated Telegraph and Electrical Subway Company be instructed to provide the same for the use of this company.

The subways laid out make provision for the future requirements of the Met. Tel. & Tel. Co. as near as can be estimated.

With regard to the work that is first needed, the following list of ten routes is submitted for construction in the respective order named:

1. Broad street line, from Water along Broad, Exchange place, Broadway, Cortlandt street to office, length of single ducts, about..... 90,120 feet
2. Park Row line, from Cortlandt street, along Broadway, Park Row to Chambers street, length of single ducts, about..... 35,560 "
3. 58th street line, from Lexington avenue to 8th avenue, length of single ducts, about..... 39,080 "
4. Spring street lines, from office on Spring street to West street, from Spring street along West Houston to Downing; from Spring street office to Christie and Grand streets; from Spring street to Christie and East Houston streets; length of single ducts about..... 34,370 "
5. Broadway line, from Park Row to 34th street; length of single ducts about334,100 "

6. Sixth avenue line, from 21st street, along 6th avenue, South 5th avenue, 4th street, West Broadway to Chambers street; length of single ducts about	123,250 feet
7. South Church street line, from Broadway, along Exchange place and Church street to Cortlandt street; length of single ducts about.....	14,390 "
8. North Church street line, from Chambers street, along College place, Barclay, Church to Cortlandt street; length of single ducts about..	37,860 "
9. 36th street line, from 8th avenue to Lexington avenue; length of single ducts about.....	106,260 "
10. 14th street line, from 7th avenue to 1st avenue; length of single ducts about.....	77,700 "
Total.....	892,690 "

This company recommends the following construction of the routes asked for as best suited to meet its requirements:

Route 1.—Iron pipe laid in hydr. cement concrete.

Route 2.—Iron pipe laid in hydr. cement concrete.

Route 3.—Zinc tubes laid in hydr. cement concrete.

Route 4.—Brook's oil iron pipe, laid in asphaltic concrete, wood box.

Route 5.—Iron or cement pipe laid in hydr. cement concrete.

Route 6.—Iron or cement pipe laid in hydr. cement concrete.

Route 7.—Creosoted wood conduits and casing, or cement pipe laid in hydraulic cement concrete, or terra cotta pipe, with patent joint, or prepared wood tubes in hydraulic cement concrete, or asphaltic or coal tar concrete in the discretion of the engineer.

Very respectfully,

THEODORE N. VAIL, President.

And on motion, duly seconded, laid over to be reported on at the next meeting of the Board.

Application by C. W. Dayton, counsel for the New York Electric Lighting Company, for a permit to string overhead wires in North New York, was, on motion duly seconded, laid over until the form of permit should be passed upon.

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The following letter from the Consolidated Telegraph and Electrical Subway Company was read:

NEW YORK, July 7, 1887.

To the Honorable, the Commissioners of the Board of Electrical Control:

GENTLEMEN:—I beg leave to submit the following statement on behalf of the Consolidated Telegraph and Electrical Subway Company.

This company made extensive preparations last year, and accumulated a large amount of material to carry out the work authorized by the Board of Commissioners of Electrical Subways, to be commenced on the first of March last, and which was subsequently suspended. This material is now on hand, and is applicable to the construction of the electrical subway routes for which it was originally intended, viz.:

First route, from Central office on Cortlandt street. up Broadway, Park Row to the Brooklyn Bridge and Chambers street.

Second route, on Broadway, from Canal street to Spring street, and down Spring street to West street, and new extensions on West Houston street, East Houston street and Grand street.

Third route, on 58th street, from 8th avenue to near the East River.

The materials on hand amount to about 75,000 lin. ft. of $2\frac{1}{2}$ and 3-inch wrought iron pipe, about 85,000 lin. ft. of $2\frac{1}{4}$ -inch zinc tubing, about 6,000 feet of creosoted wooden boxes and a supply of cast iron junction and service boxes for the Spring street Brook's oil pipe as authorized. Work can be started on each of the above routes at a week's notice, and will be prosecuted rapidly.

We believe the construction of the main lines applied for by the Met. Tel. and Tel. Co., which will include provision for other and similar telegraphic service, will best be met by the use of wrought iron pipe and cement pipe laid in hydraulic cement concrete. This would apply to the chief Broadway line, including the Broad street section, as it is most essential to provide once for all the most permanent and substantial work, so as to avoid all future alterations or repairs involving the tearing up of pavements.

With regard to the other routes applied for, covering the continuation of the present Sixth avenue line, down South Fifth avenue and West Broadway, the North and South Church street lines, the 14th and 36th street lines, we would ask that the use of creosoted wood conduits and casing, cement pipe, laid in hydraulic cement concrete, terra cotta pipe, prepared wood tubes laid in hydraulic cement concrete, and asphaltic or coal tar concrete be authorized, and the choice left to the discretion of the engineers of your honorable Board and of this company, so that the prosecution of the work may be more rapidly pushed by enabling materials to be obtained simultaneously from different sources, it being impossible, in our opinion, to rely on any one source proving sufficient.

We have carefully examined the requirements of the electric light companies, and believe that their interests will best be served by grouping their main subways other than for distribution in a single structure or trench on one side of the streets where the telephone and telegraph subways are grouped on the opposite side of the same street. This provides an equitable division for both, and gives the necessary protection from interruption, so far as can be obtained to the more sensitive telephonic currents.

With regard to the materials for electric light subways, we recommend preferably the use of cement pipe laid in hydraulic cement concrete and terra cotta conduits, but also believe that iron pipes laid in concrete, as requested by some of the companies, will give a very suitable structure. I have the honor to remain,

Very respectfully,

LEONARD F. BECKWITH, Chief Engineer.

And on motion, duly seconded, laid over, to be passed upon at the next meeting of the Board.

Engineer Kearney, in his report, stated:

That the conduit on Sixth avenue, from 21st street to 58th street, consists of two sections of Dorsett pipe, with twenty-four holes, or ducts, of $2\frac{1}{2}$ inches diameter each, was built for the accommodation of the telephone and telegraph service only, and that four of the ducts are now occupied by the Metropolitan Tel. and Tel. Co., with four cables, of one hundred wires each, for the entire length of the conduit; and one of the ducts is occupied by a cable of the Fire Department of this City. All are working satisfactorily.

The following resolution was offered by Commissioner Gibbens:

Resolved, That the maps and plans on file in the offices of this Board stand approved, and that the Consolidated Telegraph and Electrical Subway Company be notified to commence work within ten days.

Adopted by the votes of Commissioners Hess, Gibbens and Moss, the Mayor not voting.

At a suggestion by the Mayor, the matter of local distribution was referred to the engineers of the Consolidated Telegraph and Electrical Subway Company, the Met. Tel. and Tel. Co. and the Board of Electrical Control, for a report to be made on same at the next meeting of the Board.

On motion by Commissioner Gibbens, duly seconded, the following resolution was offered:

Resolved, That a Chief Inspector and Six Assistant Inspectors be appointed to examine and report on the condition of electrical conductors overhead, the number of poles, their owners, the distance apart, and all details in connection with electrical service, these points to be collected by the chief inspector and his report made to the Board from time to time, with suggestions as to where it would be advisable to make changes in the electrical overhead service.

On motion, duly seconded, this was laid over until the next meeting of the Board.

The following resolution was offered by Commissioner Hess and adopted:

Resolved, That the several electrical companies operating electrical wires in the City of New York be, and the same are hereby directed, within thirty days, to remove any and all wires, either on poles or house-tops, not in actual use or operation.

On motion of the Mayor, duly seconded, it was

Resolved, That the Secretary present, at the next meeting of the Board, all applications made for electric light privileges.

Also, that the minutes of the Board be printed and copies sent to each member of the Board, also the Corporation Counsel, as soon as received by the Secretary.

Meeting adjourned until Wednesday, July 13th, 1887, at 11 a. m.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, on Wednesday, July 13th, 1887, at 11 a. m.

Present: Acting Mayor H. R. Beekman, Commissioners Jacob Hess, D. L. Gibbens and Theodore Moss.

The minutes of the previous meeting (July 7th), also the minutes of the meeting of July 5th were read and approved.

The following letter from the Corporation Counsel was read:

NEW YORK, July 12th, 1887.

HON. ABRAM S. HEWITT, Mayor, Etc.,

SIR:—I am in receipt of a communication from your office, dated July 9th, 1887, inclosing a proposed bond from the Consolidated Telegraph and Electrical Subway Company to the Board of Electrical Control and others, with the request that I should examine the same and report to you whether the paper is sufficient in form and free from legal objection.

[JULY 13, 1887.]

I have examined the inclosed bond and herewith return it to you with the suggestion that the word "or" on the eleventh line of the seventh page should be stricken out and the word "and" inserted in the place thereof.

If amended, as above suggested, the proposed bond would be, in my opinion, sufficient in form and free from legal objection when properly executed.

Very truly yours,

MORGAN J. O'BRIEN, Counsel to Corporation.

Corrections having been made as suggested, the bond was accepted and ordered to be filed with the Comptroller.

Engineer Kearney reported that a permit having been obtained from the Department of Public Works, work had been commenced by the Consolidated Telegraph and Electrical Subway Company on the 58th street conduit section, to extend from Third to Eighth avenues, as laid down in the plan on file, and that some five hundred feet of trench had been opened this morning.

In reply to an inquiry of Commissioner Hess as to local distribution, Engineer Kearney stated that, after conference with the engineer of the Metropolitan Telegraph and Telephone Company, he preferred, with the approval of the Board, to allow that company to select and submit a system best adapted to meet its requirements.

The following communication from the Edison Electric Illuminating Company was read:

NEW YORK, July 11th, 1887.

To the Commissioner of the Department of Public Works, New York City:

DEAR SIR:—The Edison Electric Illuminating Company respectfully request permission to make an opening and excavate trenches in certain streets for the laying of the Edison underground and electric light conductors, commencing at the corner of 24th street and Broadway, running parallel with the west face of the block on Broadway and 5th avenue, crossing 23d street to the corner of 5th avenue; thence across 5th avenue to the point of intersection of Broadway and 5th avenue; thence along the west side of Broadway to the corner of 21st street.

The route as described is more particularly illustrated in the blue print map attached to this communication.

It is respectfully requested that the permission may be granted for this work in advance of other underground construction, in order that these conductors may be laid previous to the putting down of new pavement on 5th avenue, work on which is now nearly approaching to this point.

This application is intended to be subject to the rules and regulations of the Board of Electrical Control, and their agreement thereto.

Very respectfully yours,

Referred to the Engineer.

J. H. VAIL, Chief Engineer.

Commissioner Gibbens moved that the Consolidated Telegraph and Electrical Subway Company be directed to proceed as soon as possible to construct a conduit, to consist of 24 iron pipes, three inches in diameter, laid in hydraulic cement, according to the plans on file in the office of the Engineer of the Board, to be laid from seven to twelve feet from the west curb of the pavement with manholes at convenient distances, commencing at the corner of 24th street and Broadway, running parallel with the west face of the block on Broadway and Fifth avenue, crossing 23d street to the corner of Fifth avenue; thence across Fifth avenue to the point of intersection of Broadway and Fifth avenue; thence along the west side of Broadway to the corner of 21st street, with provision for the distributing rods of the Edison Electric Illuminating Company, and, in addition thereto, and along the same route, but within from seven to twelve feet from the line of the easterly side of the street, a similar subway, for telegraph and telephone wires, to contain 24 ducts of iron pipe, $2\frac{1}{2}$ inches in diameter, laid in hydraulic cement, with convenient manholes.

The motion was amended by the Mayor to the effect that the Engineer submit maps of the route of the above mentioned conduits at the next meeting of the Board.

The resolution was then passed as amended.

Commissioner Gibbens called the attention of the Board to the fact that papers had been served on the members of the Board to show cause why they should not be restrained from proceeding in their work, and suggested that Mr. Henry C. Andrews and Mr. Charles A. Hess, who had heretofore represented the Board, be retained to appear and act as attorneys for the Board in this suit.

Approved and so ordered.

The following resolution was offered by Commissioner Gibbens:

Resolved, That the Engineer appoint a Chief of Inspection, who shall be entitled to receive \$250 per month, and whose duty it shall be to overlook the construction of underground work done by the Consolidated Telegraph and Electrical Subway Company under the direction of the Engineer, and to do such other work as the Board may from time to time direct, and the Engineer shall, at the first meeting of the Board, report upon such appointment.

On suggestion from the Mayor this was laid over until the next meeting of the Board.

The following resolution was offered by Commissioner Gibbens:

Resolved, That in the inspection of the work to be done by the Consolidated Telegraph and Electrical Subway Company it shall be the duty of the engineer to employ suitable and sufficient inspectors to keep himself and this Board informed

as to the character of the work, and whether same is proceeding in all respects according to the instructions of this Board at a compensation not to exceed \$4 per diem, and said compensation only to continue during actual employment, and it shall be the duty of the Chief Engineer to furnish to the Assistant Secretary information in regard to said inspectors' services such as will enable said Assistant Secretary to keep a record of said services to be laid before the Board for its approval. On the appointment of such inspectors the Engineer shall, at the first meeting of the Board thereafter, report the same for the consideration of the Board, with the reasons for such appointment.

Adopted.

Commissioner Gibbens again moved the resolution above in reference to the appointment of a Chief of Inspection.

On motion of the Mayor, this was laid upon the table, and the Engineer was directed to report at the next meeting of the Board as to the necessity for such an officer, and generally as to the necessary qualifications and duties of proper inspectors of work done by direction of the Board.

Application for the Pennock Battery Electric Light Company for a conduit to be constructed from No. 26 Whitehall street to the N. Y. Stock Exchange was referred to the Engineer to report as soon as possible.

Application of the Ball Electrical Illuminating Company to erect poles and appliances for electric lighting purposes was laid on the table until the rules and regulations submitted by Commissioner Gibbens were ready.

Meeting adjourned until Friday, July 15th, at 11 a. m.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, on Friday, July 15th, 1887, at 11 a. m.

Present: Acting Mayor H. R. Beekman, Commissioners Jacob Hess, president; D. L. Gibbens, and Theodore Moss.

The minutes of the last meeting were read and approved.

Acting Mayor Beekman presented a communication from General Newton and also a report of the committee.

The Secretary then read the report.

The following resolution was offered by Commissioner Gibbens:

Resolved, That the report and rules be accepted and adopted, and that printed copies be presented to the heads of the Fire and Police Departments and to the Corporation Counsel.

Resolution adopted by a unanimous vote.

Mayor Beekman laid before the Board a communication received by him from General Newton, which the Secretary read, and is as follows:

NEW YORK, July 13, 1887.

HON. HENRY R. BEEKMAN, Acting Mayor,

SIR:—As requested in your letter of the 9th inst., I have duly considered the rules and regulations offered for adoption by the Board of Electrical Control, concerning the placing of poles and the stringing of wires through the public streets in this City. I approve them as they now stand, but suggest the following additional rules:

All poles now standing, or hereafter to be erected, shall be branded or stamped with the initials of the company owning them.

When an old pole is taken down it must be removed from the street the same day.

New poles must not be brought upon any street more than two days in advance of their erection.

Any pole that shall lie on any street more than two days shall be removed by the Bureau of Incumbrances of the Department of Public Works at the expense of the party owning it.

All electrical companies having poles in the public streets shall give a bond to the City in a reasonable amount, conditioned for the payment of the cost of removing dangerous and abandoned poles, and also for the payment of the expense of restoring the sidewalks and pavements where the same have been disturbed or injured in consequence of the erection or removal of any poles owned by them.

Very respectfully,

JOHN NEWTON, Commissioner of Public Works.

Commissioner Gibbens then moved the following resolution:

Resolved, That the communication be spread on the minutes, and that the Secretary return the thanks of the Board to General Newton for his suggestions in the matter.

Adopted.

On motion of Commissioner Gibbens, the matter of applications and permits for overhead poles and wires was made a special order for the next meeting of the Board.

Commissioner Gibbens offered the following resolution:

Resolved, That the Engineer be called upon to furnish to this Board as fast as possible, and from time to time, reports as to the condition of the overhead service, and specifically in reference to the poles and wires in every street in the City; and to this end he be empowered to select inspectors or collectors of information to the number of eight, as to whose appointments he shall report for the consideration of the Board at meetings following any appointment, and at a compensation not to exceed four dollars per diem; and it shall be the duty of the engineer to report as rapidly as possible as to any conditions of the overhead service which are dangerous to life or property, and as to where changes can properly be ordered in conformity with the rules and regulations of the Board in reference to overhead wires; also as to dead wires and useless poles.

Adopted; all voting in the affirmative.

The report of the Engineer was then read. It is as follows:

NEW YORK, July 15th, 1887.

To the Board of Electrical Control of the City of New York:

GENTLEMEN:—In answer to the request of the Board at the last meeting "that the Engineer report the necessity of the inspection of the work in progress and qualifications of such inspectors," I have to report:

I would follow the precedents of all similar public works in recommending that this Board have at least one inspector on each separate portion of the work during the working hours and receive his orders from the Engineer, and see that they were carried out, and keep a record of the conduits as constructed and all underground obstructions that would be met in such construction. I believe men for this position can be obtained at a compensation of \$4 a day.

It would also be necessary to have a Chief Inspector, who would have charge of, and the general supervision of, all works in progress and the Inspectors just mentioned, who could report more directly and quickly to the Chief Engineer. Such a man must be one in whom the Engineer could have implicit confidence and whose knowledge of similar work would well make him worth at least \$250 per month.

Respectfully,

HENRY S. KEARNEY, Chief Engineer.

By Commissioner Moss: I move that the report of the Engineer, as read, be adopted. The motion carried, the Acting Mayor voting "no."

Commissioner Gibbens then offered the following resolution:

Resolved, That the Engineer appoint a chief of inspection, who shall receive \$250 a month, and who shall overlook the work under the direction of the Engineer, and to do such other work as the Board may from time to time direct, and report upon such appointment.

Adopted, Acting Mayor Beckman voting "no."

The Engineer was called upon to submit maps of the work as directed at the last meeting. The Engineer then submitted and explained the maps to the Board.

Mr. Beckman moved the following resolution:

Resolved, That Henry C. Andrews, one of the attorneys of the Board, be called upon to report to the Board at the next meeting his opinion in reference to the power of the Commission or any municipal authority to order the removal of gas pipes from the route which may be established for any subway.

Adopted. (Reconsidered).

Mr. Gibbens submitted to the Board a petition of the Safety Electric Light and Power Company for power to lay, erect and construct wires over and under the streets of the City of New York, and moved that the petition be laid upon the table to be considered at the next meeting. There being no objection, President Hess so ordered.

The Secretary then read the following applications on file:

Safety Electric Light and Power Company, to erect, lay and construct electrical conductors in the City of New York, underground, or otherwise.

East River Electric Light Company, for underground accommodations similar to Sixth avenue conduit, as follows: Avenue B and Clinton street, from 20th street to East Broadway; East Broadway, Canal street, Grand street, 14th street, 23d street, Third avenue, Bowery and Park Row, Sixth avenue, Broadway.

Mount Morris Electric Light Company, to string wires and place electrical conductors temporarily overhead in the district of 110th street.

North New York Electric Light Company, to stretch new wires in North New York.

Brush Electric Illuminating Company, to erect 1,115 new poles in various parts of the City.

United States Illuminating Company, to erect 3,310 poles in various places.

Edison Electric Illuminating Company, general application.

Ball Electrical Illuminating Company, to erect new poles, etc., as and where warranted.

Pennock Battery Electric Light, to lay a conduit, holding ten conductors, from No. 26 Whitehall to New York Stock Exchange, at Broad and Wall streets.

General Averill appeared before the Board to argue against the use of iron pipe imbedded in hydraulic cement as a conduit for carrying electrical wires.

The following resolution was offered by Commissioner Gibbens:

Resolved, That the Board call on Mr. McNulty for the information and experience he has in regard to this, so that we may be definitely informed.

Carried; all voting in the affirmative.

Mr. Gibbens moved the adoption of the following resolution:

Resolved, That the resolution which was offered by Mr. Beekman in regard to the removal of the gas pipes from the line of the conduit be reconsidered, and that the following be substituted in its place:

Resolved, That, as it is the opinion of the Board that the question as to whether any municipal authority or this Board has the power to order the removal of gas pipes from the route laid out by the Board for any subway will ultimately come before the Corporation Counsel for his opinion, we respectfully request the Mayor to call upon the Corporation Counsel for an opinion in the matter, so that the question will be decided for the municipal authorities, and the Board may earlier know their position in the premises.

Resolution carried by a unanimous vote.

The Board hereupon adjourned until Tuesday, July 19th, 1887, at 11 a. m., at the Mayor's office.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, on Tuesday, July 19th, 1887, at 11 a. m.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess, President; D. L. Gibbens and Theodore Moss.

The minutes of the last meeting were read and approved.

President Hess called on Chief Engineer Kearney to make a report to the Board of the work that has been done.

Chief Engineer Kearney thereupon appeared before the Board and made a statement to the effect that work had been commenced on the conduit at 24th street and Broadway to 23d street, and across Fifth avenue on both sides of Broadway; that some portion had been finished, and he expected it would be completed inside of three days; that the work on the 58th street conduit was progressing rapidly.

President Hess stated to the Board that one of the principal objects of the meeting was to obtain information concerning the use of hydraulic cement in the construction of subways, and that Mr. George McNulty, Assistant Engineer of the Brooklyn Bridge, was present, having been so requested by resolution of the Board, and he called upon Mr. McNulty to make a statement in regard thereto.

Engineer McNulty then stated to the Board that in all his experience he had seen nothing better for the preservation of iron than hydraulic cement. Mr. Roeb-ling, of the Brooklyn Bridge, always used it. His associate Engineer, Mr. Buck, had examined the cables of the bridge across the Niagara River that had been treated in this manner and found them but very little damaged. He had himself examined the cables of the Clifton bridge. In the construction by Mr. Roeb-ling of a bridge across the Allegheny River in 1841, the cables were buried in hydraulic cement, and when the bridge was taken down in 1861 the cables were found comparatively uninjured.

In response to inquiries by Mayor Hewitt, Mr. McNulty said that it was necessary that the iron should be perfectly clean before being placed in the cement. He had cleaned the iron he used with acids and afterward with alkali. He generally used Rosendale cement, which he found to be the best. The Akron cement set very rapidly, and disintegration set in soon afterward.

Chief Engineer Kearney and Mr. Beckwith, the engineer of the construction company, both stated that the pipes now being laid across Fifth avenue, while sufficiently protected, were not, owing to lack of time, as carefully prepared as they would be in future work.

President Hess stated that General Averill was present, and he suggested that if there was no objection he would like to hear him on the subject.

General Averill opposed the use of hydraulic cement and presented specimen of iron pipe that had been destroyed by it, and introduced Contractor Salter, who saw the pipe taken from the Government buildings in Chicago. Mr. Salter said the pipe was imbedded in the cement, which had to be broken from around it. He presented certificates from J. Lyman Blake and Architect Post, stating that iron pipe corrodes rapidly when imbedded in this cement. He presented to the Board a sketch he had made as to how the subway should be constructed, and also a specimen of pipe made of thin layers of wood covered with asphaltum, which he said was indestructible, and which could be furnished at one-half the cost of iron pipe.

Mr. Birdsall, Chief Engineer of the Department of Public Works, stated that cement would preserve iron from corrosion. In the Department work it was customary to have iron pipes covered with a coating of red lead and linseed oil before use.

Commissioner Gibbens suggested that the application of companies to string wires overhead having been a special order for this meeting, the application of the Safety Electric Light and Power Company was read.

President Hess, upon a resolution adopted that this application and all other applications before the Board be referred to a committee, appointed Mayor Hewitt and Commissioner Gibbens as such committee. Mayor Hewitt declining to serve, he appointed Commissioner Gibbens.

Mayor Hewitt moved the following resolution:

Resolved, That the rules and regulations adopted by the Board be submitted to a competent electrical engineer, to be selected by Commissioner Gibbens, to report at the earliest possible moment as to whether they are sufficient, or whether any additional safeguards can be provided.

Adopted; all voting "aye."

Chief Engineer Kearney made a report to the Board in regard to the appointments to be made under the resolution passed at the last meeting, and presented the name of Charles G. Cornell to be Chief of Inspection.

Commissioner Gibbens moved the following resolution:

Resolved, That the report of the Chief Engineer be adopted, and that Charles G. Cornell be confirmed as Chief of Inspection.

Mayor Hewitt then offered the following amendment:

Resolved, That the resolution of appointments be laid on the table until the Board can get further information that Mr. Cornell is qualified for the place.

Resolution lost, all voting "no" except Mayor Hewitt.

Mayor Hewitt then offered the following resolution:

Resolved, That the resolution of appointment be referred to a committee to be named by the Chair to investigate the qualifications of Mr. Cornell, and report to the Board whether he is qualified for the position or not.

Resolution lost; same vote as on last resolution.

Mayor Hewitt moved the following resolution:

That the Board now adjourn. Resolution carried, Commissioner Gibbens voting "no."

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday, July 22d, 1887, at 12 noon.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess and D. L. Gibbens.

The minutes of the last meeting were read and approved.

The following communication from the Consolidated Telegraph and Electrical Subway Company was read:

To the Honorable, the Commissioners of the Board of Electrical Control:

GENTLEMEN:—The Construction of the electrical light subways and the telephone and telegraph subways now being laid on Broadway at the crossing of Fifth avenue and 23d street is progressing rapidly and will be completed within a few days.

We respectfully request your Honorable Board to authorize the continuation of this construction southward to 14th street, and northward to 34th street, where the new work will join the Sixth avenue subway and assist materially to utilize the latter. The immediate prosecution of this work is important, in order to effect its completion in this great thoroughfare during the summer, when the least interruption to traffic occurs, and also in order to obtain sufficient length of electrical light subways, in which the efficiency of underground construction can be tested.

The Edison Illuminating Company have their material on hand for their mains and feeders, which go in one trench, for their work on the cross streets from 30th street to 21st street, between Fifth and Sixth avenues. We respectfully request the authorization for our company to have this work continued.

The telephone service in the downtown districts is very much inconvenienced by the lack of facilities and the growth of the business. We respectfully ask the authorization to construct the subways on Broad street, Exchange place, Broadway to Cortlandt street, where the line connects with the routes already authorized;

also the routes on Church street, from College place down to and through Exchange place, where it connects with Broadway; also such other routes already applied for to your Honorable Board on the 7th inst. as may be deemed advisable, and of the construction then recommended.

The necessity of authorizing the construction of routes lies in the difficulty of obtaining supplies in sufficient quantities for rapid construction. We can not obtain deliveries in less than four to six weeks from time of ordering, nor can we avail ourselves of the advantages of legitimate competition among the bidders, unless work is authorized ahead. I have the honor to remain,

Very respectfully,

LEONARD F. BECKWITH, Chief Engineer.

[Referred to Engineer.]

Commissioner Gibbens offered the following resolution:

Resolved, That the communication of the Consolidated Telegraph and Electrical Subway Company be referred to the Engineer, and that he be requested to submit at the next meeting of the Board plans and specifications for the work asked for, with information as full as can be obtained in reference to the route for the consideration of the Board.

Adopted; all voting in the affirmative.

Commissioner Gibbens, in offering the following resolution, said that he found that the Board of Aldermen have been in the habit of granting such rights without requiring compensation, or but very nominal compensation; that the United States, the Brush and the Edison Electric Light Companies were authorized to have their wires in the streets of the city without compensation, except that wherever they were permitted to open streets they were obliged to pay one cent per lineal foot; that a committee of the Board of Aldermen, which recently investigated this subject, decided that to put any extra burden on new companies would place the new companies in an inferior position to the old ones, and that the committee reported to the Board that the only thing which could be secured in the authorization of the new companies was competition, by which light can be supplied to the people and to the City cheaper than if these companies were not authorized.

Commissioner Gibbens, continuing his report, said that the Board of Electrical Control is granted the same power in regard to this matter that the Board of Aldermen formerly had; that the Board of Aldermen undoubtedly had the power to require compensation to the City, but this committee which investigated this subject carefully, which was composed of very intelligent men—men of high standing in the community—came to the conclusion that it was not fair to these new companies to make them pay more than the old companies were paying; that as the Board is only vested with the same power which the Board of Aldermen had that he was unable to see how the Board can require anything further of the old companies

than the Board of Aldermen did; that the policy of fairness which the Board of Aldermen possessed in regard to the new companies should hold in this Board; that the compensation for the City is regulated to some extent by the contract of the Board with the Consolidated Telegraph and Electrical Subway Company; that the policy of the Board of Aldermen was to authorize any company to proceed which made an application, and which was properly organized under the laws of the State, had a substantial directory, some capital, and which the Board considered would proceed in good faith, requiring such company to pay one cent per lineal foot and to furnish one arc light in every fifty, if they did any arc lighting; that it would be within the spirit of the action taken by the Board of Aldermen to require these new companies, and, if possible, the old ones as well—if we can consider the permission given by the Board of Aldermen—to be one cent per lineal foot occupied by their conductors, and that it would be well to keep up this requirement of one arc light in every fifty.

Commissioner Gibbens then submitted to the Board a form in which companies could properly proceed in this business, and asked that the form be referred to Mayor Hewitt, as a committee of one, to report upon it at the next meeting, and he suggested that the Mayor secure the opinion of the Corporation Counsel on the subject. The form referred to is as follows:

Resolved, That the company is hereby authorized and empowered to lay, erect and construct suitable wires or other conductors with the necessary poles, pipes or other fixtures, in, on, over and under streets, avenues and public parks and places of the City of New York, for conducting and distributing electricity, and to the full extent that could, with the consent of the municipal authorities of the City of New York, be given to any gas light company, under, or by reason, or in pursuance of an application made by any of the corporations especially referred to in Chapter 512 of the General Statutes of New York for the year 1879, or to any company organized under the so-called Manufacturing Corporations Act, Chapter 40, of the Laws of 1848, in pursuance of the provisions of the Act, Chapter 73 of the General Statutes of New York for the year 1882, under the provisions of the Board of Electrical Control and of the Commissioner of Public Works and of the Department of Public Parks, within their respective jurisdictions; and subject to all existing rules applicable thereto and to all regulations of the privilege hereby conferred, which this Board may hereafter impose by resolution or otherwise; provided always, and this consent is given upon these express conditions, and not otherwise, that until the further order or resolution of this Board the electrical conductors of the said company shall not be laid, erected or constructed, nor shall any of the privileges above granted be exercised otherwise than or except in subways constructed by the Consolidated Telegraph and Electrical Subway Company, under and in pursuance of the provisions of the Act, Chapter 716, of the Laws of 1887, under and in pursuance of the supervision of this Board, to be leased to said company by the Consolidated Telegraph and Electrical Subway Company.

And, provided further, that, as compensation for the privilege hereby granted, the said company shall pay to the City of New York a sum equal to one cent per lineal foot of street occupied by its conductors.

And, provided still further, that in case the said company shall furnish arc lights to any customer in the City of New York, then and in that case the said company shall furnish, maintain and light in the streets or avenues occupied by the said company free of charge to the City, for maintenance or otherwise, and at such place or places as may be determined by the Board of Street Lighting, one full arc light of power equal to the average required at the time in contracts with the City for such electric lights for every fifty arc lights furnished by said companies to their customers, and shall make return under oath of the number of such private arc lights whenever required by the said Board of Street Lighting.

Commissioner Gibbens further stated that he had invited the companies asking permission to appear at the offices of the Commissioners, and bring with them such evidence as they have about the matters he had just spoken of, and that the Safety Electric Light and Power Company appeared by Mr. Stetson and produced a certified copy of its articles of incorporation, and showed that it had paid the State tax on the amount of its capital stock, and ten thousand dollars had been paid in, and that it was, in his opinion, a bona fide company and such as should be authorized to enter into business.

Commissioner Gibbens then moved the following resolution:

Resolved, That when the Board shall have adopted a form in which these permissions shall be granted, the Safety Electric Light and Power Company shall receive the permission of the Board.

[Withdrawn.]

Commissioner Gibbens withdrew his resolution and offered the following in its place:

Resolved, That the matter of form in which permission shall be granted to electric lighting companies to have wires in the City of New York be referred to Mayor Hewitt, and that he be requested to report thereon at the next meeting of the Board.

Resolution adopted by a unanimous vote.

Commissioner Gibbens then offered the following resolution:

Resolved, That when and in case the Board adopts a policy authorizing electric lighting companies to have their wires in the City of New York, and a form is made granting permission therefor, that the Safety Electric Light and Power Company be so authorized.

[Withdrawn.]

Mr. Stetson, in behalf of the Safety Electric Light and Power Company, stated to the Board that he would prefer to wait until the report was adopted.

Commissioner Gibbens, upon the suggestion of Mayor Hewitt that this matter may wait until the Board has taken definite action, withdrew his motion.

President Hess called on Commissioner Gibbens for a report on the rules and regulations.

Commissioner Gibbens stated that he had not had sufficient time to get a proper report; that he had consulted with an electrical engineer and left the rules and regulations with him, understanding that this engineer was to make a report; that he had since informed him that he did not care to pass on them, owing to his associations, but said, without desiring to have his name used, that they were all right.

Commissioner Gibbens asked for more time.

President Hess said that the Commissioner could report at the next meeting.

Mayor Hewitt suggested to Commissioner Gibbens that as the Department of Public Works have consulted with Lieutenant Mellis, an electrical engineer, with reference to matters affecting their interests, it would be well to have his report, and, upon the suggestion of Commissioner Gibbens, Mayor Hewitt said that he would send the rules and regulations to the Department of Public Works for that purpose.

The following communication was read:

NEW YORK, July 20th, 1887.

Board of Electrical Control:

GENTLEMEN:—I desire, on behalf of the New York Central and Hudson River Railroad Company, owners of the new building now being erected on the south side of 42d street, extending from the corner of Park avenue to the Lincoln Bank Building, some 160 feet, to ask that a permit may be given to the Metropolitan Telephone and Telegraph Company to remove the present poles in front of the said property, so as not to be in front of our tenants' doorways or windows.

The telephone company have offered to exchange the present hideous poles, which are standing at a very sharp angle and are a disgrace to the property, for new ones, properly set and painted, if permission be granted.

The same thing applies to the bearing poles of the United States Electric Light Company, two of which are also in front of the same property.

Both companies inform us that they have applications before your Board for permission to do this work; and, as the owners of the property, we should take it as a great favor if the necessary permission be given to them without delay, as we are anxiously waiting to lay new sidewalk extending around the whole front.

Very respectfully,

ALFRED SKITT, Superintendent,
Fourth Avenue and 32d Street.

The following communication, referring to same matter, was read:

NEW YORK, July 21st, 1887.

Board of Electrical Control:

GENTLEMEN:—I beg to ask that consideration may be given to the several requests made by me for permits to replace two poles at 42d street and Fourth avenue, where they are required in order to give certain new telephone service to the N. Y. Central R. R.

The matter of granting permits promptly for the renewal of defective poles is of such importance that I beg to ask that, in the future, these requests may have your very prompt attention. Yours respectfully,

H. S. HUIDEKOPER, Vice-President and Gen'l Manager.

Mayor Hewitt offered the following resolution:

Resolved, That all existing telegraphic, telephonic and electric lighting companies be authorized and instructed to make such repairs to their lines as may be necessary in order to prevent them from becoming injurious to persons or property.

Adopted; all voting for the resolution.

President Hess put the request contained in the communication of Mr. Skitt, representing the New York Central and Hudson River Railroad, to a vote, and all the Board voted in favor of granting it.

Commissioner Gibbens read a communication from the Western Union Telegraph Company, which is as follows:

NEW YORK, July 16th, 1887.

To the Board of Electrical Control:

Permission is hereby requested by the Western Union Telegraph Company, a duly authorized company operating electrical conductors in the City of New York, to stretch one new nineteen-conductor cable, as follows: On the Sixth avenue elevated railroad structure, from Rector and Church streets to Sixth avenue and Twenty-third street, thence through our existing underground iron pipes to Fifth avenue, together with permission to make the necessary connection between the elevated structure and our flush box underneath by means of iron pipe, the same being necessary to the business needs of the company.

Very respectfully,

W. C. HUMSTONE, Superintendent.

Mayor Hewitt moved the following resolution:

Resolved, That the permission asked for by the Western Union Telegraph Company be granted, only pending the providing of underground accommodations, and until

suitable subway accommodations are provided, provided the said company remove within ninety days all of its poles along said route.

Adopted by a unanimous vote.

The following communication from General Averill, and the opinions accompanying same, concerning hydraulic cement, were read:

NEW YORK, July 21st, 1887.

HON. JACOB HESS, President Board of Electrical Control:

SIR:—Pursuant to my promise to the Mayor and yourself, I have communicated with the people who make the spirally-wound wooden pipe, with reference to the character of the cement used to make the layers adhere, and have received in reply that owing to the temporary absence of their expert, they are unable to inform me. It is, however, described that the ribbons of wood are first steamed, then rolled up like a roll of ribbon, and fastened in that form, and, after rolling, placed in a drying room and thoroughly dried; after this is completed, they are wound by machinery on a travelling mandrill, during which process some kind of cement is applied to cause the layers to adhere. What that is we will ascertain, if possible. It does not seem to be weakened at 300 (F.) of heat when treated with asphalt.

Very truly yours,

WM. W. AVERILL.

NEW YORK, July 21st, 1887.

GEN. W. W. AVERILL:

DEAR SIR:—In reply to your inquiry as to my experience with wrought iron pipe imbedded in cement concrete, I beg to say that in an experience extending over a period of twenty years the life of the pipe is, to a large extent, due to the purpose for which it is used, as, for instance, as in the steam-heating business, the return pipe or pipes carrying the water of condensation back to the boiler are unavoidably run under the cellar floor are subject to variable temperatures, and more or less moisture arising from evaporation. In such case the life of the pipe would not exceed five years. The same pipe imbedded in an anthracite coal ash, where the ash became wet from external influences, as in front of boilers, would not last three years. I have found standard pipe, used for gas fittings, and run even on the upper floor of buildings where the cement was always perfectly dry, the pipes subjected to no material changes of temperature give out after a period of fifteen to seventeen years' use. The effect that cement appears to have upon the pipe is to eat holes into it. I should consider the lifetime of the same pipe run in an air space, or in gravel, properly protected by asphalt, or any other means that would protect it from the action of the cement, or exhalations arising from the earth, to be indefinite. This I have found to be especially the case in pipes I have recently had occasion to remove from the Equitable Building, during a twelve years' experience in it, and especially so in the case of gas pipe during our late alterations.

Very respectfully,

J. F. WILSON, Chief Engineer.

[JULY 27, 1887.]

NEW YORK, July 22d, 1887.

GEN. W. W. AVERILL:

DEAR SIR:—In reply to your request, we would state our experience to be: 1st, that hydraulic cement will destroy wrought iron pipes imbedded in same, and, 2d, that, in our opinion, three-inch pipe as above, one-fourth-inch thick, will not last more than three to four years embedded in hydraulic cement. Yours respectfully,

D. & J. JARDINE.

Commissioner Gibbens moved that the letter from General Averill be placed with the other communications of the Board on the subject.

President Hess, there being no objection, so directed.

Mr. Beese, on behalf of the Continental Conduit Company, controlling the Beese-Grant system for subways, asked that a public test be given in competition with other systems, or that the Board direct their Engineer to examine into its merits and report.

[No action taken.]

Mayor Hewitt moved the following resolution:

Resolved, That the Board adjourn to Wednesday next, at 12 o'clock.

Adopted.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, July 27th, 1887, at 12 noon.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

On motion of Mayor Hewitt, the reading of the communications contained in the minutes, was dispensed with.

The Secretary then read the minutes.

Mayor Hewitt moved to correct the minutes by making the resolution offered by Commissioner Gibbens, commencing at line 21 of 7th page of printed minutes to read as follows:

Resolved, That the matter of form in which permission shall be granted to electric lighting companies to have wires in the City of New York be referred to Mayor Hewitt, for the purpose of securing the opinion of the Counsel to the Corporation, and that he be requested to report thereon at the next meeting of the Board.

Mayor Hewitt also moved to correct the minutes by placing the last paragraph on page 9 of printed minutes immediately preceding the words, "Mayor Hewitt offered the following resolution," on the same page.

Mayor Hewitt also moved this other correction of the minutes, that the resolution offered by him, and on page 10 of the printed minutes, be made to read as follows:

Resolved, That until the further action of this Board and until provision has been made for laying the wires underground, the said company shall have the permission asked for, provided the said company shall remove, within ninety days, all of its poles along said route.

There being no objection, the resolutions offered by the Mayor to correct the minutes as above were adopted.

Commissioner Gibbens moved to correct the minutes by striking therefrom the first resolution on page 7 of the printed minutes.

Adopted.

The minutes of the meeting of July 22d, with these corrections, were then approved.

President Hess then called on Chief Engineer Kearney for a report on the matter referred to him at the last meeting, in connection with the work asked for by the Consolidated Telegraph and Electrical Subway Company.

Chief Engineer Kearney made a report to the Board in favor of the application of the Consolidated Telegraph and Electrical Subway Company to proceed with the work on Broadway, from 14th street to 34th street, and recommended to the Board to grant the application, the work to be similar to that already done on Broadway between 23d and 24th streets, which consisted of a conduit on the east side for telegraph and telephone wires, and on the west side for electric light and power wires.

Commissioner Gibbens offered the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized and directed to proceed up and down Broadway in continuation of the work already ordered, and to complete the work in the same manner as begun in that section (Broadway, crossing Fifth avenue), which is already constructed, as far south as 14th street and as far north as 34th street on Broadway.

Mr. Cohen, on behalf of the Construction Company, asked to make a statement.

Mayor Hewitt offered the following substitute:

Resolved, That Mr. Cohen, who represents the Construction Company, be heard.

Commissioner Gibbens stated that he would withdraw his motion for the moment in order to give the gentleman a chance to speak.

Mr. Cohen thereupon made a statement that there were several methods whereby the wires could be distributed, and that the question was as to which of these methods would be adopted.

Commissioner Gibbens then renewed his resolution.

Mayor Hewitt moved to amend the resolution by adding to it: "Provided this work shall not be undertaken until the Consolidated Telegraph and Electrical Subway Company has submitted to this Board a system of local distribution which will not involve the use of poles and overhead wires."

Amendment lost; Mayor Hewitt alone voting in the affirmative.

Mayor Hewitt moved the following resolution:

Resolved, That the original resolution be laid on the table until the Board can get from the Engineer a report of a system for local distribution which will not involve the use of overhead wires and poles.

Lost. Same vote as on last resolution.

Vote was then taken on the original resolution, which was adopted by the following vote: Mayor Hewitt—no; Commissioners Gibbens, Hess and Moss—aye.

Mayor Hewitt stated that he was not ready to report on the form of franchise or upon the rules, the former had been sent to the Corporation Counsel for his opinion, and he had not received a reply; the latter he had sent to the Department of Public Works, with a request that they be submitted to Lieutenant Mellis, an electrical expert.

Commissioner Gibbens stated that he had asked the opinion of Mr. Parke Benjamin, who was an electrical expert of considerable reputation, upon the rules and regulations, and that Mr. Benjamin would state his opinion to the Board.

Mr. Benjamin stated that he had read over the rules to see whether he could see any electrical difficulty suggested by them, and that he had no suggestions to make; that the majority of the rules did not involve any electrical question. In the matter of additional rules for the security of life and property, he had had no time to investigate and could offer no suggestion at the present time.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be authorized to send to each company having electrical conductors in the City of New York a copy of the resolution offered by Mayor Hewitt at the last meeting and adopted by the Board in reference to repairs to their

lines on a paper which shall have on the back of it a copy of the rules of the Board, and that the Secretary shall furnish to companies desiring it as many additional permits of this character as may be desired.

Resolution adopted unanimously.

Commissioner Gibbens offered the following resolution:

Resolved, That at the next meeting of the Board it be made a special order to consider all these requests to have wires overhead in addition to the present service; and that a meeting of the Board take place on Friday, the 29th inst., at 12 o'clock noon, and that companies which have made requests for this additional service be notified to-day by the Secretary to renew their requests in the form of the applications which have been prepared by the Board.

Adopted unanimously.

Commissioner Gibbens offered the following resolution:

Resolved, That the Engineer be directed to report at the next meeting of the Board in reference to all wires which are now strung along Sixth avenue from 23d street to 58th street.

Adopted unanimously.

Mayor Hewitt stated that he had received two communications which he wished to have placed on file, one from T. G. Ellsworth, and the other from Geo. H. Stout, electrical experts. The Secretary was directed to have the applications printed in the minutes and the documents accompanying same placed on file.

The applications referred to are as follows:

NEW YORK, July 25th, 1887.

HON. A. S. HEWITT, Mayor New York City:

DEAR SIR:—A few days ago I was tempted to make application for the position of inspector of the Electrical Commission, but concluded that the position was created for some politician from what I could learn. My experience admirably fits me for a position of this kind. I was a constant attendant of the evening classes at Cooper Union during the time that you were Secretary, and owe much to the founder of that institution for listening for the first time to Professors Tyndal, Huxley, Proctor and Young, of old Dartmouth. I beg to ask your hasty perusal of the inclosed printed matter referring to myself and shall be glad to assist you when an opportunity presents in the administration of any part of our City affairs. Commending your action at the last meeting of the Electrical Commission, and of many other things during your brief term of office,

I am, respectfully yours,

T. G. ELLSWORTH.

[JULY 27, 1887.]

NEW YORK, July 26th, 1887.

To the Board of Electrical Control, JACOB HESS, President;

DEAR SIR:—I hereby make application for the position of chief inspector of the Board of Electrical Control.

My qualifications will be found in the subjoined references.

The experience I have had dates back to 1878, when for two years I was connected with the Bell Telephone Company, after which time, until the present, I have been connected with the Edison Electric Light Company, in either direct or indirect capacity. Three years of this time was spent abroad as an electrical engineer and inspector for this corporation, installing some of the largest electric lighting plants at that time in Europe. I feel quite competent to fill the position applied for, both in advising you upon and practically handling such electrical problems as may come within your province.

Yours very respectfully,

GEORGE H. STOUT.

There being no objection, a communication from William J. McAlpine to Mayor Hewitt was ordered to be copied in the minutes.

NEW YORK, July 26th, 1887.

HON. A. S. HEWITT, Mayor, etc.:

DEAR SIR:—I intended to have called upon you last week to personally state what is contained in the following, but an exposure to the heat has temporarily disabled me.

For a dozen years past I have been engaged in perfecting the plans of the underground railway in New York, and among other things have had to consider the provision for placing the wires for the telegraph, etc., in the structure.

Among the plans considered were those of the asphaltic concrete tubes of the Beese-Grant system, which seem to so admirably answer the purpose that I have recommended them for adoption on this work.

For the same reasons I think that they would be the best for use in placing the wires underground in this City.

Mr. Beese has informed me that he has recently laid the plans before your Board, which renders it unnecessary for me to explain them in detail further than he has done, and I have only to add that they appear to be the best adopted to make the connections with every house; the most accessible for repairs, alterations and substitutions; afford the best isolation; are the cheapest of construction and of the greatest durability.

These remarks apply equally to the smaller pipes and to the large conduits through which the inspectors and repairers are to pass.

The latter are what will generally be most applicable to our arcade plans.

The substitution of the asphaltic matrix (asphalt and coal tar) for hydraulic cement in the concrete gives it a slight flexibility, so that the extremes of cold and heat do not injuriously affect it and also materially lessens the danger of injury from lesser subsidences which the changing character of the earth on which the structure must

rest, must produce, and which can only be otherwise provided against by expensive foundations.

The durability of asphaltic masonry is shown by the Asiatic structures of that material and all of the ingredients of the proposed asphaltic concrete are of like durability.

The electricians agree in the value of this concrete as a non-conductor.

I am, very respectfully yours,

WM. J. M'ALPINE.

The following letters were read:

NEW YORK, July 26th, 1887.

THEODORE MOSS, ESQ., Secretary of the Board of Electrical Control:

DEAR SIR:—Your letter of July 6th, asking "the number of poles and wires which have been removed from Third and Ninth avenues since permission was granted to stretch cables on the elevated roads, and how many poles and wires belonging to our company remain along said avenues, and within what length of time this company will remove the same," came duly to hand, and was referred to the general superintendent to obtain accurate information on which to predicate an answer to the inquiries of your Board. I have not yet received his report, but will hurry up the matter, and give you an answer in a few days.

Our general superintendent of construction and repairs, who would have this information more directly at hand, has been ill and off duty some weeks.

Very respectfully,

NORVIN GREEN, President.

NEW YORK, July 25th, 1887.

THEO. MOSS, ESQ., Secretary Board of Electrical Control:

DEAR SIR:—I am in receipt of your favor of July 23d, addressed to the president of this company, and beg to ask your indulgence in the matter of not giving you a written reply to yours of the 6th inst., which I assumed was not necessary, as I reported verbally to your President, Mr. Hess, and to Mr. Gibbens, that all the old poles between the corner of 58th street and Sixth avenue and Kingsbridge have been removed.

This work so far as indicated above was done in a thorough and proper manner.

The work of removing the poles beyond the Kingsbridge line will be undertaken at an early day, but it is not considered important enough at the present time as to withdraw our men from more necessary work.

Trusting this explanation will be satisfactory, I am, yours respectfully,

H. S. HUIDEKOPER, Vice-Pres'dt and Gen'l Manager.

J. B. Beese, Secretary of the Continental Conduit Company, read and submitted a letter as follows:

NEW YORK, July 27th, 1887.

To the Commissioners of the Board of Electrical Control:

GENTLEMEN :—Inclosed please find several copies of the prospectus of the Continental Conduit Company.

You will find the plans and specifications of the Beese-Grant system for subways and conduits for electrical conductors and some of our plans for the modification of the same.

The plans for main subway are at pages 12, 13 and 14 of the prospectus, and the specifications which apply to the same are at pages 3, 4 and 5 of the appendix.

The plans for conduit for general service are at pages 15 and 16 of the prospectus, and the specifications which apply to the same at pages 5, 6, 7, 8 and 9 of the appendix.

The above mentioned plans for subway and conduit may be modified so as to apply for arc light, incandescent light, telegraph and telephone service, separate, or in combination.

The plans for arc blocks and building blocks, which are represented at pages 1 and 18 of the prospectus, are adapted for constructing a main subway for electrical conductors in case the plans before mentioned should not have sufficient capacity for certain localities.

While aware that you have received for consideration upward of one hundred and fifty different plans and models, we feel justified in our claim that the Beese-Grant system presented by this company excels all other systems presented, both in mechanical construction and practical application, for the purposes required. Our claims in that respect are founded on the intelligent and expressed judgment of several prominent engineers—engineers who have respectively a State, National and International reputation, and are known to the public for their integrity and capacity. Their judgment as to the Beese-Grant system has been sustained by competent electrical experts who represented by the Bell Telephone, Western Union Telegraph and United States Electric Light Companies, some of our competitors even have long since conceded the position we claim for our system.

We therefore respectfully, but earnestly request, an early opportunity to have our engineers and experts appear before your body, for the purpose of more fully setting forth the practical application of the plans herein submitted, and to substantiate the claims we have made. We are ready and willing to meet all competitors in open contention at any time and place designated, and if upon opportunity given we substantiate our claim we may certainly expect recognition from your Board.

Respectfully submitted by the Continental Conduit Company.

JOHN D. BEESE, Secretary.

Mayor Hewitt offered the following resolution in relation to this communication:

Resolved, That this matter be referred to Commissioner Gibbens for investigation and report.

Adopted; all voting in the affirmative except Commissioner Gibbens, who had left the room.

By Mayor Hewitt:

Resolved, That the Board now adjourn.

Board adjourned to Friday, July 29th, 1887, at 12 o'clock noon.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday, July 29th, 1887, at 12 o'clock noon.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read and approved.

President Hess stated to the Board that the special order of the day was the consideration of the applications for overhead privileges.

Commissioner Gibbens then read the application of the American Electric Manufacturing Company, which is as follows:

NEW YORK, July 19th, 1887.

To the Board of Electrical Control:

Permission is hereby requested by said company to erect poles and stretch wires in the streets of the City of New York, described as follows, on

Beginning at the corner of Lawrence street and 10th avenue, running thence southerly to 122d street, westerly to 10th avenue, along 11th avenue to Boulevard, 45 poles; thence southerly along Boulevard to 92d street, 38 poles; thence easterly on 92d street to 10th avenue, 4 poles; thence northerly on 10th avenue to 110th street, 46 poles; thence easterly on 110th street to 9th avenue, 8 poles; thence southerly on 9th avenue to 92d street, 46 poles; thence easterly on 92d street to 8th avenue, 8 poles; thence northerly on 8th avenue to 110th street, 46 poles; thence easterly on 110th street to 6th avenue, 18 poles; thence northerly on 6th avenue to 145th street, 92 poles; thence westerly on 145th street to 7th avenue, 8 poles; thence northerly on 7th avenue to McComb's Dam bridge, 24 poles; thence southerly on 7th avenue to 110th street, 92 poles; thence westerly on poles provided to 8th avenue; thence on 8th avenue to 155th street, 120 poles; thence westerly on 155th street to St. Nicholas avenue, 14 poles; thence southerly on St. Nicholas avenue to 110th street, 124 poles; thence by poles provided, on St. Nicholas avenue, to junction of 124th street, Manhattan street and St. Nicholas avenue; thence northwesterly on Manhattan street to 10th avenue, 16 poles; thence northerly on 10th avenue to 178th street, 136 poles; thence westerly on 178th street to Boulevard, 9 poles; thence southerly on Boulevard to 124th street, 142 poles; thence westerly on Manhattan street to 12th avenue, 10 poles; returning on same poles to Boulevard; thence easterly on Manhattan to 10th avenue, 10 poles; returning to Boulevard on same poles; also on 125th street, from 8th avenue to 11th avenue, 26 poles; also

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on 135th street, St. Nicholas avenue to 6th avenue, 22 poles; also on 145th street, 7th avenue to Boulevard, 36 poles; also on Riverside avenue, from 92d street northerly to 129th street, 76 poles.

The said poles to be iron, not less than 25 feet in height, and to conform in every respect to the rules of the Board of Electrical Control; with suitable cross-arms for safely hanging the wires. Wires and insulations shall be in conformity with the established rules of the Board of Underwriters of the City of New York; the intent and meaning of the above shall be a thoroughly equipped and constructed road.

The purpose for which permission is desired by said company is the furnishing of electric light to consumers, as may be obtained, which is the reason for this application.

Subject to the rules and regulations of the Board.

Very respectfully,

THE AMERICAN ELECTRIC MANUFACTURING CO.

By EDWARD H. GOFF, President.

Commissioner Gibbens stated that there was a letter to the Board accompanying the application, which he read, and which is as follows:

NEW YORK, July 18th, 1887.

To the Board of Electrical Control of the City of New York:

GENTLEMEN:—The prayer of your petitioner, the American Electric Manufacturing Company, respectfully shows to your honorable body:

First. That it is a corporation duly created by and existing under the laws of the State of New York, having its principal place of business in the City of New York.

Second. That it is engaged in the manufacture and sale of electric lighting machinery and apparatus, and in the construction and operation of electric lighting stations and plants in numerous towns and cities of the United States.

Third. That your petitioner desires to construct and maintain an electric lighting station and plant in the City of New York, and to erect poles and string wires thereon, through and upon the streets of that section of the said City, bounded as follows, viz.:

Ninety-second street and north to Harlem River, Sixth avenue and west to North River. Said territory being at present unoccupied by electric light wires or poles, excepting two blocks in 125th street.

Fourth. That your petitioner has been duly authorized by the local authorities of the City of New York to locate and erect poles and to hang such wires thereon, in, over and under the streets, avenues, wharves, piers and parks therein, or adjacent thereto, according to such plans as may be directed, approved or allowed by, and subject to the power of the Electrical Subway Commissioners, etc.

Wherefore, your petitioner respectfully requests your honorable body to grant unto it permission to erect poles and string wires thereon, through and upon the streets and highways of that section of the City of New York, and bounded as follows:

Ninety-second street north to the Harlem River, Sixth avenue west to the North River, and subject always to such rules and regulations as you may desire, to be observed and kept, and only until the underground conduits in said section of the City shall be ready for occupancy.

THE AMERICAN ELECTRIC MANUFACTURING COMPANY,

EDWARD H. GOFF, President.

Mr. John H. Hapgood, representing the Harlem Lighting Company, having an application before the Board covering part of the same territory, asked to have the application brought up at the same time as the application of the American Electric Manufacturing Company, but stated that his company did not approve the application of the American Company.

Mayor Hewitt suggested that the Board defer action on all the applications until after the awarding of contracts for electric lighting by the Gas Commission, and stated that the bids before that Commission would be opened August 22d next.

Mr. O'Connor, representing the American Company, stated to the Board that his company had nearly one hundred private consumers waiting for light, and that until it had the permission of the Board it could not proceed; that it had the capital and machinery, which had cost a vast amount, and everything necessary to proceed, and that the company desired to proceed without reference to the City lighting.

President Hess stated that he thought the Board would find that, when the public lighting was disposed of, there would not be so many applications for permission to erect new poles and string new wires.

The following application from the Pennock Battery Electric Light was read:

NEW YORK, July 8th, 1887.

To the Board of Electrical Control:

GENTLEMEN:—The Pennock Battery Electric Light Company desire permission to lay a conduit holding ten (10) electric light conductors, arranged according to the Pennock underground electric light system, from the central station of the company at No. 26 Whitehall street, to the New York Stock Exchange, Broad and Wall streets, so that the consumers of the Pennock electric light can be better served with the current than is now afforded over the overhead plant.

The route proposed and desired for the conduit is across Whitehall street to Bridge street, thence to Broad street, and along Broad street to Wall, a distance of about 2,000 feet.

The size of the conduit complete will be but six inches square measure.

Respectfully,

GEO. B. PENNOCK, Gen'l Manager, Pennock Battery Electric Light.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be authorized and directed to return the application of the Pennock Battery Electric Light, with a letter to the effect that the Board will not consider the application of any company for permission to stretch or lay electrical conductors until such company shall have first been duly authorized to conduct its business by the local authorities of the City of New York.

Adopted by a unanimous vote.

The following application was read:

NEW YORK, July 28th, 1887.

To the Board of Electrical Control:

Permission is hereby requested by the North New York Lighting Company to erect poles and string wires on the following streets for the purpose of furnishing light and power:

Third avenue, from 170th street to Fordham Station; Kingsbridge Road, from Fordham Station to Jerome avenue; Jerome avenue, from Kingsbridge Road to McComb's Dam Bridge; Sedgewick avenue, from Jerome avenue to Morris Dock; Washington avenue, from Third avenue to 170th street; Lincoln avenue, from S. Boulevard to Third avenue; Mott avenue, from Madison avenue bridge (138th street) to 165th street; Alexander avenue, from S. Boulevard to Third avenue; Willis avenue, from S. Boulevard to Third avenue; St. Ann's avenue, from S. Boulevard to Third avenue; 138th street, from S. Boulevard to Madison avenue bridge; Westchester avenue, from Third avenue to Bronx River; Cortlandt avenue, from Third avenue to 156th street; Southern Boulevard, from Third avenue to Boston Road; Boston Road, from Third avenue to Tremont avenue; Main street, West Farms, from Tremont avenue to Kingsbridge Road; 149th street, from S. Boulevard to Third avenue; Tremont avenue, from Vanderbilt avenue to Boston avenue, West Farms; 177th street, from Vanderbilt avenue to Jerome avenue; Kingsbridge Road, from Third avenue to Boston avenue (or Main street), West Farms; Morris avenue, from Third avenue to 164th street; 164th street, from Morris avenue to 165th street; 165th street, from Fleetwood Park to Jerome avenue.

Poles to be about 100 feet apart, subject to the rules and regulations of the Board.

Very respectfully,

J. C. WHITE, for the North New York Lighting Co.

Commissioner Gibbens stated that there was also an application from the East River Electric Lighting Company.

Mayor Hewitt offered the following resolution:

Resolved, That all these applications for electric lighting be referred to Commissioner Gibbens, as a sub-committee, to tabulate the applications so as to show the conflict of territory and report the same back to the Board for its consideration.

Adopted, all voting aye.

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The following applications for permits from the Western Union Telegraph Company were referred to the Engineer.

NEW YORK, July 28th, 1887.

To the Board of Electrical Control:

Permission is hereby requested by Western Union Telegraph Company to stretch two (2) nineteen (19) wire cables, and one (1) guard wire from the elevated railroad structure at 129th street and Third avenue, on poles to 130th street, thence through 130th street to Fourth avenue, and through Fourth avenue to the Harlem River, in order to make available the cables already up on the elevated structure between the Brooklyn Bridge entrance and 129th street and Third avenue.

Subject to the rules and regulations of the Board.

Very respectfully,

W. C. HUMSTONE, Superintendent.

NEW YORK, July 28th, 1887.

To the Board of Electrical Control:

Permission is hereby requested by Western Union Telegraph Company to stretch two (2) nineteen (19) wire cables and one (1) guard wire on poles from No. 195 Broadway, through Broadway and Park Row to the elevated railroad structure in front of entrance to the Brooklyn Bridge, in order to make available the cables already up on the elevated structure between the Brooklyn Bridge entrance and 129th street and Third avenue.

Subject to the rules and regulations of the Board.

Very respectfully,

W. C. HUMSTONE, Superintendent.

An application from the Western Union Telegraph Company "to stretch two (2) wires on poles from Canal street and Broadway to No. 436 Broadway, for the purpose of connecting into an office at that point," was, by unanimous consent of the Board, granted.

The following resolution was offered by Commissioner Gibbens:

Resolved, That all the applications now before the Board from the Metropolitan Telephone and Telegraph Company, for simply the extension of their present lines, and which do not include or intend the construction of any new poles or fixtures, be granted, and that the Secretary be authorized to sign the permits.

Adopted unanimously.

Mayor Hewitt made a motion to adjourn, which was carried.

[August 4, 1887.]

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, August 4th, 1887, at 12 o'clock noon.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read.

Commissioner Gibbens moved to correct the minutes by striking from the resolution offered by him, at the bottom of page 7 of the printed minutes, the words, "by the local authorities of the City of New York," on the last line of the resolution, and by substituting in the place thereof the words, "in the City of New York."

Unanimously adopted; and the minutes, with this correction, were approved.

The following communication from J. S. Coleman, Commissioner of Street Cleaning, was read:

NEW YORK, July 30th, 1887.

HON. JACOB HESS, President Board of Electrical Control:

SIR:—The United States Illuminating Company propose to furnish their lights at each of our dumping boards, south of 14th street, for the use of this Department. To that end, they are going to make application to your Board for permission to erect the necessary poles and to extend their wires, etc.

As these lights will without doubt be of great service to the employees of the Department engaged at the dumps, and particularly a safeguard against accident, I hope their application will be approved by you, and I will add that I shall esteem it a favor if the permission they ask for is granted at your earliest convenience.

Very respectfully,

J. S. COLEMAN, Commissioner of Street Cleaning.

Upon the suggestion of Mayor Hewitt that the Secretary acknowledge the receipt of this letter of Commissioner Coleman and say that no such application as that referred to therein had been received, the Board so directed.

The following communication from the Western Union Telegraph Company was read and ordered printed in the minutes:

NEW YORK, August 3d, 1887.

THEODORE MOSS, Esq., Secretary of the Board of Electrical Control:

SIR:—In response to your inquiry concerning the poles and wires belonging to this company on Third and Ninth avenues, having procured what I believe to be accurate information I have to say that poles and wires on Third and Ninth avenues have been taken down as follows:

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Third avenue, east side, from 55th to 110th streets, 110 poles, all told; also 17 wires on the east side of Third avenue, from 46th to 110th streets.

On Ninth avenue, east side, all the poles (75 in number) and 7 wires, from 17th to 56th streets.

We have also taken down 12 wires from 5th to 55th streets, on Avenue A and First avenue; 47 wires in 55th street, from Tenth avenue to the North River; 16 wires on Eleventh avenue, from 15th to 55th streets, and 15 wires on Tenth avenue, from 50th to 55th streets.

All the poles on the east side of Third avenue, between 46th and 55th streets, and on 55th street, from Second avenue to the East River, will be taken down as soon as an additional cable, now in hand, is put up on the Third Avenue Elevated Railroad structure.

We still have a line of poles and 35 wires on Third avenue, from 5th to 130th streets, 250 poles all told. We are embarrassed in arranging for the taking down of these poles by the fact that they are occupied a greater portion of the distance by the wires of the Police and Fire Departments of the City of New York, as well as several companies other than the Western Union.

On Ninth avenue we have a line of poles and 17 wires, from 13th to 105th street, 184 poles all told; but, as the ownership of this line is claimed by the French Cable Company, it is difficult to say anything regarding its removal.

In addition to those named above, there are a large number of poles in other parts of the City, which we expect to take down when the Broadway cable is completed, and the two additional cables already provided for placed on the structure of the elevated railroad.

Very respectfully,

NORVIN GREEN, President.

The following communication from the Metropolitan Telephone and Telegraph Company was read:

NEW YORK, July 30th, 1887.

THEODORE MOSS, ESQ., Secretary of the Board of Electrical Control:

DEAR SIR:—We are yet without definite, positive and legal authority to renew poles at 42d street and Fourth avenue, for which application has at various times been made, and I beg that, for the purpose of record, we may be supplied with the usual authority, so that in case of arrest of our men and their being taken before a police magistrate we may have papers to show that due authority was given and that the work is being done by reason of such authority.

I would also ask if the resolution passed on July 22d, that telephone companies are authorized to make such repairs to their lines as may be necessary to prevent them from injuring persons or property is to be considered that the telephone companies are to be the judges in such cases. You will remember that it has been the practice of the Subway Commission to grant permits for the removal of dangerous poles, but only upon the fact having been established by an inspection by one of your employees, and this resolution does not say whether this inspection is to be abandoned, and that the method of procedure is to be changed so that the telephone companies will be the judges in such cases.

Yours respectfully,

H. S. HUIDKOPER, Vice-President.

Commissioner Gibbens thereupon moved the following resolution:

Resolved, That the Secretary be directed to reply to this letter, and to furnish the Metropolitan Telephone and Telegraph Company with a copy of the resolution of July 22d, on the Board's permit blank, and to say that the companies are to be the judges whether their wires and poles are in safe or unsafe condition.

Adopted; all voting "aye."

The following communication from the Gamewell Fire Alarm Telegraph Company was read:

NEW YORK, August 4th, 1887.

HON. JACOB HESS, Chairman Board of Commissioners of Electrical Control:

DEAR SIR:—The Gamewell Fire Alarm Telegraph Company respectfully applies for a temporary permit to string two insulated wires, or one cable containing two wires, upon the poles of the Western Union Telegraph Company, subject to the consent of that company first being obtained, from Capt. Williams' office on 30th street, near Seventh avenue, to Broadway and 30th street, and from 14th street to 42nd street, on Broadway. Your Honorable Board has previously given us permission to string these wires, the work having been done for the purpose of making certain trials of our police signal box system in Capt. Williams' district, but the wires were taken down, the trial having, it was presumed, been concluded. It is now found, however, desirable to make another trial, and the permission is, therefore, desired to string the two wires above referred to a second time. It is believed that a trial of not over thirty days will suffice. At the end of the trial the wires will be taken down. Very respectfully,

THE GAMEWELL FIRE ALARM TELEGRAPH COMPANY,

J. N. GAMEWELL, General Superintendent.

Commissioner Gibbens moved the following resolution:

Resolved, That the Secretary be directed to furnish the permission desired by the Gamewell Fire Alarm Telegraph Company on one of the Board's permit blanks, in the usual form, subject to said company first obtaining the consent of the Western Union Telegraph Company to string the wires on their poles.

Adopted; all voting "aye" except Mayor Hewitt, who declined to vote.

The following communication was, upon motion of Commissioner Moss, and by unanimous consent of the Board, referred to the Engineer for investigation and report:

NEW YORK, August 3d, 1887.

To the Honorable, the Subway Commission of the City of New York:

GENTLEMEN:—The undersigned represent a company formed to operate a system for distribution and handling of wires in underground conduits, and for diverging from main to branch routes and buildings, rendering entirely unnecessary any overhead system of wires, patented by James F. Munsie and known as the Munsie system.

We understand that your Commission has already investigated, and, in a measure, tested several systems of underground conduits, but that none of them satisfactorily fulfill the conditions of distribution, which the wants of the various telegraph, telephone, fire alarm and other electrical systems render necessary in a great city like New York.

The undersigned believe that the Munsie system, better than any other now before your body, solves in a practical, effective way the conditions necessary to success, and respectfully request that you will, before committing the City and corporate bodies interested to any plans not thoroughly effective, designate a committee of electrical experts to hear the explanations and to study the models and plans of the Munsie system, which are ready for investigation.

Yours faithfully,

JAMES F. MUNSIE,

JOHN BURTON.

President Hess called the attention of the Board to a communication he had received from the Secretary of the Civil Service Board, the same was read, and is as follows:

NEW YORK, July 29th, 1887.

HON. JACOB HESS, Chairman Board of Electrical Control:

SIR:—I have the honor to inform you that at a meeting of the Civil Service Supervisory Board, held July 27th, 1887, the following resolution was adopted, and, having been duly approved by the Mayor this 29th day of July, 1887, is, therefore, in force:

Resolved, That the Mayor of the City of New York be recommended to amend the classification of persons in the employ of said City by adding thereto the following:

BOARD OF ELECTRICAL CONTROL—CLASS I.

Subdivision I.—Clerks, as in Finance Department.

Subdivision II.—Secretary; Chief Engineer.

Class II, Subdivision I.—First Grade, Inspectors; Second Grade, Chief Inspector.

Subdivision II.—Stenographers and Typewriters.

Subdivision III.—Messengers and persons of like employment.

Subdivision IV.—All persons in the employ of the Board not classified elsewhere.

Applications for examination and necessary information will be furnished to persons desiring the same at this office between the hours of 2 and 4 o'clock p. m.

Very respectfully yours,

LEE PHILLIPS, Secretary and Executive Officer.

Commissioner Gibbens offered the following resolution:

Resolved, That this communication from the secretary and executive officer of the City Civil Service Supervisory and Examining Boards be referred to the Attorney-General, and that he be requested to give the Board his opinion as to whether the employees of the Board of Electrical Control are subject to this classification.

Adopted. Mayor Hewitt declined to vote; all others voted "aye."

Mayor Hewitt submitted to the Board the following communication, which was read:

NEW YORK, August 2d, 1887.

HON. ABRAM S. HEWITT, Mayor, Etc.:

DEAR SIR:—I have for a long time been considering the question as to the best means of ridding the City of the disfigurements, inconveniences and danger of telegraph poles and wires, since the creation of a subway commission by the State Legislature, and for that purpose in conjunction with a scientific acquaintance (who is both a practical mechanic and inventor) I have considered the subject with great care, and we have, I think, arrived at a solution of the difficulty which at present seems to exist.

We have prepared plans for a conduit which will not only be inexpensive, and which will afford a means of an equal and simple distribution of the electric current throughout the City, but will also be almost indestructible and entirely underground.

We have been surprised (because of its simplicity) that others have not long since discovered it. I don't care to waste time with politicians. I have no axes to grind myself personally and rely solely on the merits of the plan for its adoption.

If you will be kind enough to designate time and place I shall be pleased to submit the plan for your inspection, which will not occupy over fifteen minutes of your valuable time.

Very respectfully yours,

GEO. W. PALMER.

Mayor Hewitt offered the following resolution:

Resolved, That the communication of George W. Palmer be referred to the Engineer, with instructions to confer with him, investigate and report to this Board.

Adopted unanimously.

Mayor Hewitt stated that he desired to have entered on the minutes that F. Henry Green is an applicant for the position of Electrical Engineer to this Board.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to notify companies operating conductors for telegraphic and telephonic service along Sixth avenue, from 22d to 58th streets, or any part of said route, and the owners of poles or other fixtures bearing the same that in the opinion of this Board a sufficient construction of conduits underground has been made ready for the accommodation of said service, and that the said owners or operators of the said electrical conductors above ground are notified to place electrical conductors for the transaction of their business in said conduits and to make such electrical connection therewith as may be necessary to the proper transaction of their business along said route, and to remove poles, wires or other electrical conductors and their supporting fixtures, or other devices, from said street within ninety days after receipt of this notice; and said companies are further notified to submit plans of said electrical connections hereby authorized, together with modifications of, or additions to, said conduits necessary, or deemed so to be, for making the same to this Board within ten days, or as soon thereafter as possible, so that this Board may cause said modifications and additions to be made if they appear to be proper and necessary.

Resolution adopted; all voting "aye," except Mayor Hewitt, who declined to vote, on the ground that he did not understand the subject.

Commissioner Gibbens inquired of Mayor Hewitt whether he had received any communication from the Corporation Counsel in reference to the "form" submitted by which this Board will grant the right to companies to have their wires in the City of New York.

Mayor Hewitt stated that he had had a verbal communication from the Counsel to the Corporation, and he concurred with him in the opinion that as the Board has counsel of its own, and as the City has interests which may be adverse to the action of this Board, it is not expedient for the Corporation Counsel to give opinions to the Board; if the Commission chooses to constitute the Corporation Counsel, counsel to this Board, under the directions of it, he will very cheerfully give opinions. So long as his opinions are likely to be in conflict with other counsels' it will not be conducive to that common administration which ought to prevail in this City; after very careful consideration of the subject he thought the Corporation Counsel was right, and he should not submit to this Commission any opinion the Corporation Counsel may have given him; if the Board chooses to appoint him counsel he will perform that duty; he does the same duty for the Aqueduct Commission because they have no counsel; this Board has chosen to take a different course, and the Corporation Counsel has a professional delicacy in interfering.

President Hess stated that he did not understand that the Board had counsel employed except for special cases—for special matters before the Board which required it; he had always understood, and he believed that Mayor Hewitt himself had stated at the outset of the organization, that we were not a City Board, but were a State Board, and he (President Hess) would be very glad to have the valuable services of the Corporation Counsel, if he would act.

Mayor Hewitt said that the Aqueduct Commission was a State Board, and in litigation the Corporation Counsel appears for it; the same thing could be done here; that if that course is taken the Corporation Counsel will respond.

Mr. Stetson stated to the Board that the Safety Electric Light and Power Company, for which he appeared, had an application before the Board for a consent such as the Common Council formerly gave; that the company had complied with every requirement of the Board, and he asked that there be no longer delay.

Commissioner Gibbens stated that the form by which the Board was to grant these applications had been referred to the Mayor with the result that had been stated; he had always regarded the Attorney-General as the adviser of the Board; if the matter was left to another meeting, he knew he would be in better shape to take some position in the matter. In answer to Mayor Hewitt, he further said that for the other Board

that preceded this the Attorney-General acted as adviser, and counsel was employed at his suggestion.

Mayor Hewitt said that the Attorney-General was the legal adviser of the State of New York, and there was no law making him the legal adviser of this Board.

President Hess said that if they were a City Board the Corporation Counsel must necessarily act for them, as he does for other boards, without any request or designation.

Mayor Hewitt: He is not the legal adviser of this Board.

President Hess: I don't see how we can designate him unless he be legally constituted as our adviser.

Mayor Hewitt: You can very easily adopt a resolution requesting him to act as the legal adviser of this Board, and then you can apply to him to act. He does not feel warranted in doing so when counsel represent this Commission in open Court.

President Hess: I believe that Mr. Lacombe held that he was not the legal adviser of this Board.

Mayor Hewitt: He is not obliged to act.

President Hess: So far as I am personally concerned, I would be very glad to have him. I don't want to come in conflict with the authorities here. It certainly would be a great saving of expense.

Commissioner Gibbens, in order to inform himself about the matter, asked to have the matter laid over until another meeting.

Mayor Hewitt: In view of the action that has been taken about the Civil Service communication, I would like to inquire whether there is any intention on the part of this Commission to proceed to make appointments before the opinion of the Attorney-General is received.

President Hess: None whatever, as far as I am concerned.

Mayor Hewitt: The reason I ask is this: I expect to go away for two weeks. I want to see that we arrive at a legal conclusion as to these appointments. I want to have notice.

President Hess: I can only speak for myself. I have always obeyed the law; I am very anxious not to violate it. If it is the legal condition of things that we are obliged to have our employees go through a Civil Service examination, I bow to the mandates of the law, and, until some decision is reached, I will not vote for a single employee of the Board.

Commissioner Moss also assured Mayor Hewitt to the same effect.

Mayor Hewitt: It is understood I am to have notice if the Board proceeds to make appointments? I want them to be made in accordance with law.

Engineer Kearney made a report to the Board in favor of granting the two applications of the Western Union Telegraph Company referred to him at the last meeting. President Hess called for the ayes and noes on the adoption of the report, and the same was adopted by a unanimous vote.

Engineer Kearney made a report to the Board, stating that the Construction Company had made application to construct conduits in the side streets from 14th to 33d streets, and from Broadway west to Sixth avenue, and he had recommended at a previous meeting that the Construction Company be ordered to build conduits there, and that the matter had been referred back to him. He then submitted to the Board a plan showing the route recommended, and said that he did not contemplate disturbing the Fifth avenue pavement; but that it took in the side streets between Broadway and Sixth avenue and 14th and 32d streets, and was designed to enable the companies who would use the Broadway conduits to extend their service in the side streets to Sixth avenue, and that it contemplates both electric lighting and telegraph and telephone service; that he had a memorandum of the pole service in those side streets, and he stated in detail in regard to them, taking up the streets seriatim. There is a cross section at the end of each cross street. The Brush and United States Companies are now occupying those streets with pole lines; and these companies will occupy the Broadway conduit, and this will enable them to get out through the side streets; that in the construction of this work it provides for the Edison Company, which have their own distributing system.

Commissioner Gibbens moved the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized and directed to construct subways in the streets between 14th and 33d streets, from Broadway to Sixth avenue, as indicated on a map, dated August 4th, 1887, on file in the office of the Board.

Mayor Hewitt stated that he was very reluctant to vote against the extension of these lines intended to secure better light for public or private use, but that, under the advice which he had received, he was constrained to oppose all these applications until a comprehensive plan had been adopted by the Board for the service and the distribution of the light; that no such comprehensive plan had been adopted, and that he had been advised by the Corporation Counsel that all these actions will be unlawful until such a comprehensive plan is adopted; that he would therefore vote against this and against every application for the extension of conduits or service until a general plan has been submitted to this Board and passed upon and adopted.

Resolution adopted; Mayor Hewitt voting "no."

Engineer Kearney made a further report, stating that there was an application by the construction company for authority to construct a conduit that would be an extension of the work that had been ordered in Park Row down Broadway and Cortlandt street. That it contemplates service for the telegraph and telephone people, from the Produce Exchange and Stock Exchange to the central telegraph and telephone offices, to the telephone office in Cortlandt street, to the Western Union in Dey street and to the Baltimore and Ohio in Canal street. He submitted a map to the Board and further said that it had been impossible for him to get a cross-section of every street ready by this meeting, and that a cross-section at one street intersection would change in the middle of the block.

Commissioner Gibbens moved the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized and directed to construct subways along Church street, etc., as indicated on the map, dated August 4th, 1887, on file in the office of the Board, material to be cement and iron pipe laid in hydraulic cement.

Adopted; Mayor Hewitt voting "no."

Commissioner Gibbens offered the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized and directed to continue the construction of a conduit, the material to be similar to that already authorized in Park Row, Broadway and Cortlandt street, through Broadway and Broad street, etc., etc., along the route designated on a map, marked August 4th, 1887, on file in the office of this Board.

Adopted; all voting "aye" except Mayor Hewitt, who said that he voted "no" for the reasons stated for his vote on the last resolution.

Commissioner Gibbens stated that the poles on Sixth avenue, from 22d to 58th streets, on which the Metropolitan Telephone and Telegraph Company have their wires, are all owned by the Manhattan Telegraph Company, and that company is the one to be ordered to remove the poles.

Commissioner Gibbens moved the following resolution:

Resolved, That the engineer be directed to bring in plans and specifications at the next meeting of a route from Sixth avenue and 22d street to the Mercer street station for the accommodation of the telegraph and telephone service along the route.

Carried; Mayor Hewitt voting "no."

Adjourned.

SEPTEMBER 8, 1887.]

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Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, Sept. 8th, 1887, at 12 o'clock noon.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read and approved.

The following communication from the Attorney-General was read and ordered spread on the minutes:

ALBANY, August 11th, 1887.

THEODORE MOSS, ESQ., Secretary, etc.:

DEAR SIR:—I am in receipt of your communication of the 5th instant enclosing a copy of a resolution adopted by the Civil Service Supervisory Board, recommending the Mayor of the City of New York to amend the classification of persons in the employ of said City by adding thereto certain employees in the Board of Electrical Control, and also a resolution passed by the said Board of Electrical Control, requesting my opinion "as to whether the employees of the Board of Electrical Control are subject to this classification."

In reply thereto, I beg leave to state that the communication refers to a matter now pending before the Mayor of New York, in regard to which he should be permitted to act according to his own judgment and sense of duty under the law. It would be indecorous, if not improper, for me, under these circumstances, to express any opinion upon the question.

The Board of Electrical Control being a local Board, and so intimately connected with municipal government of the City of New York, it would seem to me that the proper official to give advice is the Corporation Counsel.

Should the Attorney-General express an opinion upon questions arising in regard to the administration of the Civil Service law under the municipal government of the City of New York, and the duties and obligations of its officials in connection therewith, it would, I think, be an unauthorized interference with matters entirely outside of his province, and in the event of such opinion differing from the views of the duly constituted authorities of such municipality embarrassment and confusion would inevitably ensue.

Presumptively the question as to whether the Mayor can or cannot make the classification of the employees of your Board will be correctly decided by him, and certainly, until he has asked my advice in regard to his duties, it would, to say the least, be very unwise to give it. If he entertains any doubt as to his duties he would naturally, and, as I think, properly, consult the legal adviser of the corporation.

Very truly yours,

D. O'BRIEN, Attorney-General.

The following application from Ledoux & Co. was read and ordered spread on the minutes:

NEW YORK, August 8th, 1887.

The HON. JACOB HESS, President Board of Electrical Control:

SIR:—On behalf of our Dr. A. R. Ledoux, who is now on his passage from England to this country, we beg to make application that he be reappointed expert to your Honorable Commission.

Dr. Ledoux is entirely familiar with "insulation" in all its branches, and has made himself practically acquainted with the best systems at present in use in Europe.

Trusting that he may receive your most kind consideration, we are, sir,

Very respectfully yours,

LEDOUX & CO.

Commissioner Gibbens called the attention of the Board to a communication from the Ball Electrical Illuminating Company, asking that immediate attention be given to its application now before the Board for the erection of poles and the running of wires for the purpose of electric lighting on certain streets therein specified. Upon the suggestion of President Hess the Board ordered reference to the communication to be made in the minutes.

The following communication from the Department of Public Works was read:

NEW YORK, September 7th, 1887.

To the Board of Electrical Control:

Under date of August 5th ultimo, I informed the Counsel to the Corporation that your Board, through Mr. Kearney, its Engineer, had refused to pay the wages due to inspectors in the work of constructing the conduits on Broadway, from 14th to 34th streets, and that Mr. Kearney had assumed to write across the face of two pay certificates statements that the inspectors were entitled to pay for a lesser number of days than certified by the Department. I requested the Counsel to the Corporation to give me his opinion and advice as to the course which I should pursue under the circumstances. I have received his reply, dated the 2d inst., in which, after reviewing at length the relations between the construction company (the Consolidated Telegraph and Electrical Subway Company), the Commissioners of Electrical Subway, who were your predecessors, and your own Board, he comes to the conclusion that, under the terms of the second contract with the Construction Company, dated April 7th, 1887, which was specially confirmed by Chapter 716, Laws of 1887, the Construction Company, and not the Board of Electrical Control, is the party to whom this Department has to do in the matter of permits to open streets, and that consequently Mr. Kearney, who is an employee of your Board, and not of the Construction Company, has nothing whatever to do with the amount to be paid to our inspectors by the Construction Company. The Counsel to the Corporation further advises that, if any work is now being done by the Construction Company under permits heretofore issued to the Commissioners of Electrical Subways, or the Board of Electrical Control, and not to the Construction Company, such permits are insufficient

to warrant the disturbance of street surfaces by the Construction Company, and that I should require that company, before proceeding further with the work, to take out permits, one of the conditions of which should be that the Construction Company should pay the wages of inspectors appointed by me, upon the certificate of the amount of pay to which they are entitled.

In accordance with this advice all existing permits issued by this Department to the Commissioners of Electrical Subways, and to your Board, under which any work is now being done, or hereafter to be done, are hereby revoked, and you are requested to return them to this office so that new permits may be issued to the Construction Company as the Counsel to the Corporation advises.

Very respectfully,

D. LOWBER SMITH.

Deputy and Acting Commissioner of Public Works.

Commissioner Gibbens: That is entirely correct, and the Board should so order immediately.

Mr. Lauterbach, president of the Consolidated Telegraph and Electrical Subway Company, stated to the Board that his company would apply for the permits to be issued, and it was willing that the inspectors should be paid. We have paid from the 20th of August to the 1st of September the sum of \$996—we have done it without any demur.

President Hess said that he thought attention ought to be called to the fact that the Department of Public Works appointed nineteen inspectors for work that did not cover, perhaps, half a square mile in extent. It is claimed that this Board has no right to appoint anybody except he goes through a Civil Service examination, but these men do not go through Civil Service.

The three following communications, in reference to manhole covers, were read:

NEW YORK, August 4th, 1887.

To the Commissioners of the Board of Electrical Control:

GENTLEMEN:—It is reported to me by the engineer in charge of the Fifth avenue pavement that the manhole covers placed over the subways are round in plan and their upper surfaces sloping, two defects together making it impossible to effect a strong and permanent junction between the pavement and manholes. It must be evident to any one that the rounding in plan of the manhole covers is in itself very objectionable. I have hastened to communicate with the Commission in order that a remedy may be applied to the manhole covers which have already been laid and a change of form designed for future ones. Very respectfully,

JOHN NEWTON, Commissioner of Public Works.

[SEPTEMBER 8, 1887.]

NEW YORK, August 15th, 1887.

MR. THEODORE MOSS, Secretary Board of Electrical Control:

SIR:—By direction of the Mayor, I enclose herewith a communication this day received by him from the Commissioner of Public Works in reference to the form or shape of manhole heads used in the construction of underground electrical conduits, and requesting that said form and pattern be changed.

Very respectfully,

ARTHUR BERRY, Secretary.

NEW YORK, August 11, 1887.

To the Board of Electrical Control:

GENTLEMEN:—I beg to inform you that the present form or shape of manhole heads used in the construction of underground electrical conduits, under your direction, is objectionable, for the reason that it is very difficult to properly join pavement blocks to them, and this Department has to request that, in place of the present pattern, manhole heads be hereafter used which are rectangular on the surface and vertical on the sides.

Very respectfully,

D. LOWBER SMITH,

Deputy and Acting Commissioner of Public Works.

Commissioner Gibbens: I suggest that the attention of the Engineer be called to this, and that he ascertain whether this form of manhole cover is the best that can be made; if not, that he design another which will be better and that he report to the Board thereon at its next meeting.

Engineer Kearney: Those communications have been answered, and a new plan has been submitted.

The following communication from J. S. Coleman, Commissioner of Street Cleaning, was read:

NEW YORK, August 5th, 1887.

THEODORE MOSS ESQ., Secretary Board of Electrical Control:

SIR:—I beg to acknowledge the receipt of your letter of yesterday, stating that no application has as yet been made by the United States Illuminating Company to your Board for the privilege of extending their wires along certain streets, so as to cover our dumping boards, and in reply would state that we were informed that they would make application on the 30th ult., and being very anxious that our "trimmers" should have lights at all the dumping-boards on the 1st inst., or as soon thereafter as possible (on account of the change from day to night work on that date to cover all the territory south of Fourteenth street), I wrote you at once.

I am now informed that the application was delayed on account of certain examinations that were being made, and that it will be forwarded to you to-day. The service will be a great benefit to our "trimmers," and to the Department generally. I trust, therefore, that prompt and favorable action will be taken by your Board.

Very respectfully yours,

J. S. COLEMAN.

Commissioner Moss: There has been no application received in reference to the matter of this communication up to the present time.

Engineer Kearney stated to the Board that the request contained in the following communication had been complied with:

NEW YORK, August 19th, 1887.

To the Board of Electrical Control, Mayor's Office:

GENTLEMEN:—I beg to inform you that the receiving basins on corner of 27th street and Broadway have not been replaced in a satisfactory manner, the bottom of culvert being but one inch above the bottom trap, when there should be six inches. You are hereby notified to place the basins in as good condition as they were originally.

Yours respectfully,

HORACE LOOMIS, Engineer in Charge of Sewers.

The following letter from Mayor Hewitt to President Hess was read:

NEW YORK, August 27th, 1887.

JACOB HESS, ESQ., President Board of Electrical Control:

SIR:—I enclose herewith a petition from very respectable firms doing business on Broadway, between Dey and Cortlandt streets, complaining of the condition in which the street is kept by the laying of the conduits authorized by the Board of Electrical Control. From personal observation, I find that the complaint is well founded; but I have no power to apply the remedy. I would suggest that you at once notify the parties doing the work that greater expedition should be used in its completion, and that during its progress as little annoyance as possible shall be inflicted upon the occupants of the property fronting on the street.

Yours respectfully,

ABRAM S. HEWITT, Mayor.

President Hess: On the receipt of that letter I sent for Mr. Crimmins, the contractor, and told him to expedite the work and place more men on it, which he assured me would be done; and I presume it has been done.

The following communication from the Engineer of the Construction Company was read:

NEW YORK, September 8th, 1887.

To the Honorable, the Commissioners of the Board of Electrical Control:

GENTLEMEN:—We respectfully request your Honorable Board to authorize the construction of the following electrical subways:

First. The extension of the Sixth avenue subway southward from 21st street, down Sixth avenue, through 4th street, through South Fifth avenue and West Broadway to Chambers street, where it will connect with a line of communication already authorized.

This subway will provide facilities for telephone and telegraph service, and is shown in detail on the map submitted herewith. The completion of this work during the present year is imperatively required by the necessity for a through and continuous line of communication which it will give between the uptown and downtown districts of the City.

We recommend for the construction of this subway the use of creosoted wood; 2-inch casing for the section extending between 21st street and Spring street and the use of wrought iron and cement pipe laid in hydraulic cement concrete for the section extending from Spring street to Chambers street, where it connects with the same kind of construction as authorized by your Honorable Board.

We have reliable assurance that the necessary materials for the above construction will be delivered in time to enable its completion before winter.

Second. The construction of a subway on Whitehall street, from Water to Beaver, and through Beaver to Broad street, with a branch on Battery Place and Bowling Green, from Greenwich to Whitehall streets, as shown on the map submitted herewith.

This subway will supply the needs for telephone and telegraph connection in the above district, and it is important that this small piece of work should be completed this year in order to enable one of the telephone exchanges to be transferred and concentrated at Cortlandt street. We recommend for this piece of work the use of wrought iron pipe laid in hydraulic cement concrete, as it forms part of a section in which this construction is already authorized by your Honorable Board.

Third. The requirements for electrical light facilities in the district extending from 18th to 45th street and from Third to Seventh avenues is provided for by the construction of the electrical light subways, as shown on the map submitted herewith. The chief electric conduits in this district are the continuation of the Broadway electric light subway from 34th to 42d street, and the Sixth avenue electric light subway from 45th to 18th street. The construction of this last mentioned subway will furnish underground accommodation for the existing electric light wires, which are the only ones left on Sixth avenue, for which subways have not yet been provided. The electrical subways in this district will consist of iron pipe laid in hydraulic cement concrete, together with the Edison iron pipe laid in the same trench above the former.

Fourth. The construction of a short section of six ducts, to be built from the manhole situated on the northeast corner of 42d street and Sixth avenue for the

purpose of connecting an existing underground system with the new Sixth avenue subway. Also the construction of a short section to be built from the manhole at the intersection of 33d street, Sixth avenue and Broadway, along the south side of 33d street to Treanor's Building. The object of the construction of these short sections is to conduct telephone wires from the present Sixth avenue subway to a building on the respective blocks for the distribution of wires from said buildings on the same block. We recommend the use of creosoted wood tubing for these distributing connections.

We trust that your Honorable Board will approve and authorize the construction of the above mentioned work, which is very much needed for the accommodation of existing wants, and which, if now authorized, will enable us to obtain the necessary materials in time for its completion during the present year.

The construction of the subways authorized by your Honorable Board is progressing in a satisfactory manner, in spite of the delays and difficulties encountered in its prosecution through the busiest thoroughfares of the City, and notwithstanding the numerous obstructions met with in the course of the work, and the exact location of which cannot be obtained from any existing records, and can only be determined by actual excavation.

The electric light subway on the west side of Broadway, extending from 14th street to 34th street, will be completed within a week or ten days; the telephone and telegraph subway on the east side of Broadway is completed from 21st street to 25th street, and will be vigorously pushed to 14th street and 34th street, now that the way is free from obstructions.

The line on 58th street, from Third to Eighth avenues, is completed, practically, with the exception of the crossing at Fifth avenue, delayed by reason of the new pavement.

The work on Church street is advancing well from Exchange alley northward to Chambers street.

The work on the Broadway and Park Row branch is now well under way, and when it is considered that this subway, containing 104 ducts in one part, 70 in another, etc.; etc., is not only the largest in the City, but the largest known, the difficulties incident to its construction in the crowded condition of the street, both above and below the ground, will be appreciated, and will account for the delay experienced.

I have the honor to remain, yours very respectfully,

LEONARD F. BECKWITH, Chief Engineer.

Commissioner Gibbens: This communication from the Consolidated Telegraph and Electrical Subway Company—does it meet with your approval, Mr. Kearney?

Engineer Kearney: Yes, sir.

Commissioner Gibbens: You have looked into this matter?

Engineer Kearney: I do recommend it. Part of it is what the Board asked me to report upon at this meeting; that is, the extension of the Sixth avenue conduit.

Commissioner Gibbens moved the following resolution:

Resolved, That the routes and plans submitted by the Engineer of the Consolidated Telegraph and Electrical Subway Company, and desired by that company, be authorized by the Commission, and that said company be authorized to proceed to construct subways in accordance with maps in the office of the Commission, dated September 7th, 1887.

Adopted; all voting "aye" except Mayor Hewitt, who voted "no."

Commissioner Gibbens: At a previous meeting I was called upon to tabulate these applications for additional overhead service pending the construction of underground accommodation; and I did make a tabulation to a certain extent; and in the district, which is north of 58th street, there are four companies only in that district, and it was easy to make a tabulation of that part, because the streets up there are comparatively free from electric light poles at present; and what streets had electric light poles in them I was able to ascertain from driving around. But, before we permit any of these companies to erect new poles, I think the best way for us to do would be to refer all these applications back to these companies and let them make new applications to the Board on the basis of the contracts which they have received from the Gas Commission, and at the same time require these companies which desire to have their wires in the streets to inform the Commission—because it is not at present in condition to inform itself intelligently—whether there are any facilities for electric light wires in these streets—any poles in these streets; and, if so, to whom they belong, and whether they can place those wires on the poles already existing, or whether there are any poles on the street, and generally inform us on the condition of the overhead service; also to submit to the Board such wishes or desires as they may have in reference to putting the whole or any part of the service which they require underground. In the matter of this electric light service underground we are still somewhat at sea. The companies have not submitted to the Engineer their requirements, and, except in the case of the Edison Company, do not know what they want done. I think it would be serviceable to the Engineer if we could have the suggestions of these companies; and there will be cases where we can supply them with underground facilities before it is necessary for them to carry out their contracts with the Gas Commission. If that meets with the approval of the Board, I propose a resolution:

Resolved, That all the applications from electric lighting companies now on file with the Board be returned to the respective companies making such applications, and that such companies be notified to make new applications to the Board, expressing their requirements in the matter of additional service, particularly stating what part of each request is designed to carry out contracts given by the Gas Commission, and the condition of the overhead service in each street in which the company desires to place its conductors, subject to the rules of the Board; and, finally, to give to the

Board any suggestions or desires which the company may have in the matter of placing its wires underground.

Adopted by a unanimous vote.

Commissioner Gibbens: I would like to inquire whether the Engineer of the Board has here any plan or map showing exactly what work has been completed since the last meeting of the Board:

Engineer Kearney: I have no map here; I have a statement.

Commissioner Gibbens: What I would like to have here at each meeting is a statement of what work has been completed from the time of the preceding meeting, so that we may order the wires underground in that section without delay. In 58th street I understand there is a conduit completed for telegraph and telephone service. I move, Mr. Chairman, the following resolution:

Resolved, That the Secretary be directed to notify companies operating conductors for telegraphic and telephonic service along 58th street and neighboring parallel streets, from Third to Eighth avenues, or any part of said route, and the owners of poles or other fixtures bearing the same, that, in the opinion of this Board, a sufficient construction of conduits underground has been made ready for the accommodation of said service, and that the said owners or operators of the said electrical conductors above ground are notified to place electrical conductors for the transaction of their business in said conduits; and to make such electrical connections therewith as may be necessary to the proper transaction of their business along said route, and to remove poles, wires or other electrical conductors and their supporting fixtures, or other devices, from said street, within ninety days after receipt of this notice. And said companies are further notified to submit plans of said electrical connections hereby authorized, together with modifications of, or additions to, said conduits necessary, or deemed so to be, for making the same, to this Board, within ten days, or as soon thereafter as possible, so that this Board may cause said modifications or additions to be made if they appear to be proper and necessary.

Adopted, all voting aye.

Commissioner Gibbens read to the Board the following newspaper clipping:

"Work on the North and East River Railroad is being pushed as rapidly as possible. Workmen are engaged in moving the sewer heads in Fulton street outside the car tracks. This is necessary to make room for the underground electrical conduit which will supply the motive power. In the excavations on the west side, work is delayed by the excessive heat of the steam-heating pipes, and on the east side, near the Fulton Ferry, the traffic is so great that work is only done at night. The electric motors will be attached to the trucks of each car, and the current supplied by copper rods in the underground conduits between the tracks. If the experiment proves successful, it will be the first practical demonstration of the value of electricity on street railways, and may in time supplant the overworked car horse."

And he moved the following resolution, which was adopted without objection:

Resolved, That the Secretary notify the police authorities that this Board is informed that work (referred to in this newspaper statement) is being done without the permit of the Board.

Commissioner Gibbens: I would like to ask whether the Engineer has communicated with the superintendent of the Fire Department Telegraph System in connection with the Sixth avenue conduit?

Engineer Kearney: I addressed a letter to the Superintendent of the Fire Alarm, Mr. Smith, asking him to call on me. Mr. Smith called and said that he had no right to talk to me officially, but that as soon as the conduit was built they could place a cable from the Mercer street office to the uptown office. I was under the impression when I got through talking with him that when the conduit was built down to the Mercer street office they would then occupy it.

Commissioner Gibbens: Did he allege any reason why the Fire Department could not occupy the conduit as far as built?

Engineer Kearney: No.

Commissioner Gibbens: I move that the Secretary be directed to communicate with the Fire Department upon that subject.

Not acted upon.

President Hess: I think I can answer Mr. Gibbens. I believe last fall application was made by the Fire Department for moneys to purchase cables to put into these conduits, which application was not granted. The result is that they have no money to purchase cables to replace their overhead system for an underground system, no matter how trifling. I believe that is the cause that is alleged.

Commissioner Gibbens: They are putting a cable in the 58th street conduit, and they have put a cable in the Sixth avenue conduit.

President Hess: I believe one of the companies—the Standard Cable Company—have taken their chance of getting paid. They have no available funds now, as I understand it, to convert their overhead system for an underground even on Sixth avenue.

Commissioner Moss: Mr. Smith said that if the department could get under the elevated road they would take down their poles.

Commissioner Gibbens offered the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be requested to submit to the Board, as soon as possible, the rules and regulations which it proposes to enforce in the matter of the use by companies of conduits built under the direction of this Board.

Adopted by a unanimous vote.

Commissioner Gibbens moved the following resolution:

Resolved, That the Corporation Counsel be requested to act as the legal adviser of this Board.

Passed by a unanimous vote.

The following resolution was moved by Commissioner Gibbens and adopted by a unanimous vote:

Resolved, That the Board request the opinion of the Counsel to the Corporation as to whether this Board is vested with sufficient authority, under the acts under which it is constituted, to compel a company owning poles in the City of New York to allow its poles to be used by other companies.

Commissioner Moss stated to the Board that the applications of the Metropolitan Telephone and Telegraph Company now before the Board did not contemplate the erection of any new poles, but were simply for the extension of the existing service and on the existing lines of poles. Commissioner Gibbens thereupon moved the following resolution, which was unanimously carried:

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company, numbered from 46 to 115, inclusive, be granted.

The following resolution was moved by Commissioner Gibbens and unanimously adopted:

Resolved: That the application of the Western Union Telegraph Company (numbered 45) "to erect a 10 conductor cable on its existing poles, from Ninth avenue through 41st street to Seventh avenue, thence through Seventh avenue and 46th street to Fourth avenue, thence through Fourth avenue to the Grand Central Station, for the purpose of looping the railroad wires into the cable on the Ninth avenue elevated road," be granted.

Commissioner Gibbens moved the following resolution, which was unanimously adopted:

Resolved, That the application of the Western Union Telegraph Company (numbered 44) "to run a 19 wire cable, with guard wire, on poles from the elevated railroad

structure at Eighth avenue and 125th street, through 125th street and Manhattan avenue to the Manhattanville depot of the N. Y. C. & H. R. R. depot," be granted, provided it does not involve the erection of any new poles on those streets.

Commissioner Gibbens: I now move that permission be granted to the Safety Electric Light and Power Company, in the form which was reported to this Board by a committee on the form in which such applications should be granted, and that the Secretary be directed to make out the permission for the company in that form.

Withdrawn.

Mayor Hewitt moved the following resolution, which was adopted:

Resolved, That the application of the Safety Electric Light and Power Company be referred to the Corporation Counsel for the purpose of drafting a resolution which this Board may adopt, so as to place that company in the same position as other electric light and power companies are.

Mr. Oliver, representing the O'Brien Conduit Company, appeared before the Board and asked to submit the plans of that company to the Board, or its experts, and requested the Board to set a time for that purpose; and he stated that the company's plan had already been submitted to the old Board.

Commissioner Gibbens stated that the Board was in possession of all the facts in relation to the O'Brien conduit, and if there was any place where the Board desired to use it, it would do so.

Douglas Levein, Jr., appeared before the Board and stated that his company had a plan of conduit which was entirely new, and offered to lay a mile of it at its expense if the Board would permit it.

The following resolution, on motion of Commissioner Gibbens, was unanimously adopted:

Resolved, That the matter presented to the Board by Mr. Levein be referred to our Engineer to make investigation and report to the Board.

The Board thereupon adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Tuesday, September 20, 1887, at 12 o'clock noon.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read.

Mayor Hewitt moved the correction of the minutes by substituting at the end of the resolution offered by him, on page 18, the word "stand" in place of the word "are."

With this correction the minutes were approved.

President Hess called for the reading of communications to the Board.

The following communication and resolution from the Corporation Counsel was read:

LAW DEPARTMENT,

OFFICE OF THE DEPARTMENT TO THE CORPORATION,

NEW YORK, September 20th, 1887.

HON. THEODORE MOSS, Secretary Board of Electrical Control:

SIR:—I have received your letter of 13th instant containing a copy of the resolution of the Board of Electrical Control as follows:

Resolved, That the application of the "Safety Electric Light and Power Company be referred to the Corporation Counsel for the purpose of drafting a resolution which this Board may adopt, so as to place that company in the same position as other electric light and power companies are."

The other electric light or power companies to which privileges have been granted are:

1. The Edison Electric Illuminating Company of New York, by resolution adopted by the Board of Aldermen, March 22d, 1881. (See proceedings of the Board of Aldermen, Vol. 49, page 73.)

2. The United States Illuminating Company of New York, by resolution of the Board of Aldermen, finally adopted May 3d, 1881. (See same volume, page 104.)

3. The Brush Electric Illuminating Company, resolution adopted May 3d, 1881. (See same volume, page 105.)

4, 5, 6, 7, 8 and 9. The Waterhouse Electric and Manufacturing Company, The American Electric Manufacturing Company, The Ball Electric Illuminating Company, The Mount Morris Electric Light Company, The Harlem Lighting Company and the North New York Lighting Company, by resolution approved June 13th, 1887. (City Record of June 20th, 1887, page 1625.)

I have prepared a resolution, which I enclose, in which is embodied all the privileges conferred, and all the limitations imposed, upon such companies, in the resolutions referred to, and, also, the additional provision: That the conductors of the petitioning company shall be operated only in and through the subways constructed under the supervision of the Board of Electrical Control. I remain,

Yours respectfully,

MORGAN J. O'BRIEN, Counsel to the Corporation.

FORM OF RESOLUTION.

Resolved, That the New York Safety Electric Light and Power Company, of New York, is hereby authorized and empowered to lay, erect and construct suitable wires or other conductors, with the necessary poles, pipes or other fixtures in, on, over and under, streets, avenues and public parks and places of the City of New York, for conducting and distributing electricity, and to the full extent that could, with the consent of the municipal authorities of the City of New York, be given to any gas light company under, or by reason, or in pursuance of an application made by any of the corporations referred to in Chapter 512 of the general statutes of New York, for the year 1879, or to any company organized under the so-called manufacturing corporations act, Chapter 40, of the laws of 1848, in pursuance of the provisions of the act, Chapter 73 of the General Statutes of New York for the year 1882, under the direction of the Board of Electrical Control and of the Commissioner of Public Works and of the Department of Public Parks, within their respective jurisdictions; and subject to all existing rules applicable thereto, and to all regulations of the privilege hereby conferred, which this Board may hereafter impose by resolution or otherwise; provided always, and this comment is given upon this express condition, and not otherwise, that until the further order or resolution of this Board the electrical conductors of the said company shall be laid, erected, or constructed, and the privileges above granted shall be exercised only in and through subways constructed by the Consolidated Telegraph and Electrical Subway Company, under and in pursuance of the provisions of the act, Chapter 716, of the Laws of 1887, under and in pursuance of the supervision of this Board, to be leased to said company by the Consolidated Telegraph and Electrical Subway Company.

And provided further, that as compensation for the privilege hereby granted the said company shall pay to the City of New York a sum equal to one cent per lineal foot of street occupied by its conductors.

And provided still further, that in case the said company shall furnish arc lights to any customer in the City of New York, then in that case the company shall furnish, maintain and light in the streets or avenues occupied by said company, free of any charge to the city, for maintenance or otherwise, and at such place or places as may be determined by the Board of Street Lighting, one full arc light of power equal to the average required at the time in contracts with the city for electric lights, for every fifty arc lights furnished by said companies to their consumers, and shall make returns under oath of the number of such private arc lights whenever required by the said Board of Street Lighting.

Commissioner Gibbens: The resolution near its end says: "for every fifty arc lights furnished by said companies to their consumers." It seems to me it ought to read "by said company to its consumers." So amended, I move the resolution be adopted.

Resolution thus amended, adopted by a unanimous vote.

The following other communication from the Corporation Counsel was read:

LAW DEPARTMENT,
OFFICE OF THE DEPARTMENT TO THE CORPORATION,
NEW YORK, September 15th, 1887.

HON. THEODORE MOSS, Secretary Board of Electrical Control, 1218 Broadway:

DEAR SIR:—I received a communication from your Board requesting my opinion as to whether your Board is invested with sufficient authority to compel a company owning poles in the City of New York to allow its poles to be used by other companies. The knowledge of this fact having been brought to the attention of the several companies who would be affected by the opinion, they have requested that I should afford them an opportunity to be heard on the subject. I have, therefore, fixed on Saturday, the 17th instant, at 11 o'clock a. m., in order that they might present their views on the question. My purpose in writing is to afford your Board an opportunity, should they deem it advisable, to furnish me with any additional information or suggestions other than contained in your communication of September 12th.

Yours respectfully,
MORGAN J. O'BRIEN, Counsel to the Corporation.

Commissioner Gibbens: I might say that I was at the office of the Corporation Counsel last Saturday, and the matter was informally discussed. Counsel for the different companies which were to be affected desired to put in briefs with the Corporation Counsel, and he gave them time for that purpose.

A communication, as follows, from the Commissioner of Public Works, was read:

DEPARTMENT OF PUBLIC WORKS,
COMMISSIONER'S OFFICE, No. 31 CHAMBERS STREET,
NEW YORK, September 17, 1887.

To the Board of Electrical Control:

GENTLEMEN:—For the information and guidance of this Department in the supervision and inspection of the work done in the public streets in placing electrical conduits or subways, it is necessary that the Department have a copy of the contract made by your Board with "The Consolidated Telegraph and Electric Subway Company" for the construction of the subways, and I would ask that you will furnish such copy of the contract at your earliest convenience.

Very respectfully,
JOHN NEWTON, Commissioner of Public Works.

Commissioner Moss stated that the Board did not have a copy of the contract. Mayor Hewitt said that the contract could be found in the act, and the Board—there being no objection—upon the suggestion of President Hess, ordered the Secretary to send a copy of the act to the Commissioner of Public Works.

The following communication from the Police Department was read:

POLICE DEPARTMENT OF THE CITY OF NEW YORK,
300 MULBERRY STREET,

NEW YORK, September 13, 1887.

To the Honorable Board of Electrical Control:

GENTLEMEN:—I am directed by the Board of Police to acknowledge the receipt of your favor of the 12th inst., relative to work being done on the North and East River Railroad, without permission of your Honorable Board, and in reply to state that the same has been referred to the superintendent for the action necessary thereon.

Very respectfully,

WM. DELAMATER, Deputy Chief Clerk.

The following application from the North and East River Railway Company was read:

THE NORTH AND EAST RIVER RAILWAY COMPANY,
120 BROADWAY,

NEW YORK, September 19, 1887.

HON. JACOB HESS, President Board of Electrical Control, New York City:

SIR:—The North and East River Railway Company hereby makes application to your Honorable Board for permission to lay, or cause to be laid, along the line of its railway, extending from Burling Slip by way of South and Fulton streets to West street, and thence southerly to the ferry station of the Pennsylvania Railway, an electrical conduit for the transmission of power to be applied to the propulsion of its cars, and lighting, heating and signally for the same.

The consent of the Common Council of the City of New York to the construction of its roads, granted December 30th, 1886, provided, among other things, as follows:

"Sixth.—The plans upon which this North and East River Railway shall be built and operated are those of the Bentley-Knight Electric Railway Company, and are described as follows: The plant consists of a stationary source of power, engines, boilers and dynamos, electric machines, which may be located at an extreme end of the line, at tide water, or at a station, a conduit running from the source of power to and along the whole length of the line, containing stationary and permanent conductors, which receive and distribute the electric current to the motors placed under the cars and geared to the wheels or axles; and a depending conductor, which, passing through a slot in the conduit, and sliding in contact with the stationary conductors, maintains unbroken connection with the source of power."

I have the honor to submit herewith a plan of the conduit, and to state that the electrical equipment, now completed and ready for delivery, is in accordance with the requirements of the section above quoted. The work upon the ordinary tracks is proceeding to rapid completion, and the necessary changes in the sewer heads, steam heating, gas, water and other connections are being made as rapidly as the crowded state of the street will allow.

This permit is desired in order that, when all the preliminary work shall have been completed, the conduits may be laid without delay and the street put in perfect order and repaved, it being the intention of the company to place the street in a better condition throughout its length than it was before operations were commenced.

I am, Sir, your obedient servant,

ROWLAND R. HAZARD, Chairman Executive Committee.

Commissioner Gibbens moved the following resolution:

Resolved, That the Secretary be directed to request the opinion of the Corporation Counsel on the question of the legal status of the North and East River Railway Company, and the right of the company to construct a line of railroad from Burling Slip, by way of South and Fulton streets, to West street, then southerly to the ferry station of the Pennsylvania Railway, and in connection therewith an electrical conduit for the transmission of power to be applied to the propulsion of its cars, and lighting, heating and signaling for the same.

Adopted, all voting "aye."

Commissioner Gibbens offered the following resolution in connection with the same matter:

Resolved, That the plans submitted to the Board by the North and East River Railway Company, together with such other plans as the company may be able to furnish to the Board, be referred to the Engineer of the Commission to report to the Board as to the propriety of constructing the electrical conduit desired by the company in the way proposed, and in order that he may have full information from an electrical standpoint, that he be authorized to consult Professor Plymton, the Chairman of the Brooklyn Commission; and that the Engineer be requested to report to the Board whether the conduit proposed is a proper one for the purpose, and also how far the proposed conduit can be combined with a general subway for electrical conductors along the route.

Adopted, all voting "aye."

The following resolution was then offered:

Resolved, That the Engineer be directed to ascertain from the Gas Commission, and in such other way as he may be able to do, what part of the routes contemplated by the contracts awarded by the Gas Commission on the first of September are along streets in which there are now no electric lighting poles; and that he be directed to submit to the Commission a plan for underground accommodation for the companies in those sections of the city at the next meeting of the Board, and also an estimate, as nearly as he can make it, as to the time which will be required to carry out and complete a subway in each locality.

Mr. O'Connor, on behalf of the American Electric Manufacturing Company, stated to the Board that the delay might work injury to that company, as it had only sixty days from the signing of its contract with the Gas Commission in which to fulfill it.

Mayor Hewitt drew from Mr. O'Connor the fact that the contract with the Gas Commission had not yet been signed.

The resolution was unanimously adopted.

The following communication from Palmer & Levein was read:

GEORGE M. PALMER,

LAW OFFICES, COMMISSIONER U. S. COURT OF CLAIMS,

No. 335 Broadway.

NEW YORK, September 19, 1887.

To the Honorable Commissioners of Electric Control:

SIRS:—At the meeting of your Commission, at the Mayor's office on Thursday, September 8, 1887, we applied to your Board to examine a new cement conduit, the invention of a Mr. P. R. Green.

In answer to our application, we understood your Board to say that they were ready to examine our system at any time.

We now notify your Honorable Board that, if you have any authority in the premises, and have not delegated all the powers conferred upon you by the Legislature to a "Construction Company," we are now ready and shall be happy to demonstrate the practicability, usefulness and durability of our conduits. We will lay it at any time and in any place you may be pleased to designate. We make this offer so as to insure your personal attendance.

We don't know what the costs may be of laying the conduits that have thus far been adopted, nor is it generally known; but we do know that we can compete in price, and that nothing yet adopted can equal our conduits for durability and adaptability to the uses required.

It was suggested by members of your Commission that the objection to adopting a uniform system of conduits was that if a uniform system was adopted many new and useful systems of conduits (which inventive genius might supply), would be shut out, that the object of the Commission was, if possible, to obtain for the city the best system of conduits.

If that statement was made in good faith, we may hope to succeed in securing your attention.

We are satisfied that no disinterested engineer of any standing or reputation will gainsay the facts, that a concrete conduit, such as ours, will outlast any conduit that has thus far been laid under the direction of your Board. Another fact to be considered is the accommodation to be afforded by our system to those who will use the conduits, providing as it does for house to house supply if required, and permitting as it does

a speedy and economical repairing of wires, should they so require, besides which the work under our system cannot only be better done, but more speedily than any other, thus preventing the continued and unnecessarily long obstruction of our streets.

The conduit which we propose to lay is indestructible.

Trusting you will afford us the opportunity of demonstrating the truth of our allegations, we have the honor to be

Very respectfully yours,

PALMER & LEVEIN.

Commissioner Gibbens: This system, as I understand, was, by resolution, referred to our engineer at the last meeting, to report upon at his convenience. I presume, when he is ready to report, he will so inform the Board.

Commissioner Gibbens moved, and the Board passed the following resolution by a unanimous vote:

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company, now on file, and numbered from 117 to 136, inclusive, be granted.

Commissioner Gibbens called the attention of the Board to a number of applications of the Manhattan District Telegraph Company, on file with the Board, and moved the following resolution, which was unanimously adopted:

Resolved, That the applications of the Manhattan District Telegraph Company be referred to the Engineer to ascertain their nature and report thereon to the Board.

Engineer Kearney was called on for a report and presented a map to the Board with a statement as to the work completed.

Commissioner Gibbens offered the following preamble and resolution:

Whereas, In the opinion of this Board a sufficient construction of conduits or subways underground has been made ready, reference being had to the general direction and vicinity of the electrical conductors in use overhead in the following streets and localities of the city, to wit: Broadway from Thirty-fourth to Fourteenth street, Twenty-third, Twenty-fourth, Twenty-fifth, Twenty-sixth, Twenty-seventh and Twenty-eighth streets, from Fifth to Sixth avenue, Nineteenth and Twenty-first streets, from Broadway to Sixth avenue; therefore, be it

Resolved, That the Secretary be directed to notify the owners or operators of the electrical conductors above ground in said streets or localities, to make such electrical connections in said streets with such underground conduits or subways as may be necessary to the proper transaction of their business, and to place electrical conductors for the transaction of their business in the said conduits, and to remove poles, wires or other electrical conductors above ground and their supporting fixtures or other

devices from the said steets and localities within ninety days after the receipt of this notice. And said companies are further notified to submit plans of said electrical connections hereby authorized, together with modifications of or additions to said conduits necessary, or deemed so to be, for making the same, to this Board, within ten days, or as soon thereafter as possible, so that this Board may cause the said modifications or additions to be made, if they appear to be proper and necessary; and, in case the said suggestions for the modification of or additions to said conduits are not submitted to the Board, or do not appear to the Board to be proper and necessary, the following methods are designated by the Board for the making of the said electrical connections in the said streets; for electric light and power conductors, subsidiary iron tubes from the nearest manhole in said subway to the point desired to be reached, and through said iron tubes insulated wires or cables connecting the lights, machinery or termini of overhead lines with electrical conductors in the said conduits. For other service, subsidiary pipes or boxes, either of wood or iron, extending from the nearest manhole to the point desired to be reached, with insulated conductors connecting the instruments or termini of overhead routes with the wires in the said conduits. The Consolidated Telegraph and Electrical Subway Company is authorized and directed to construct said subsidiary ducts or boxes at such places as shall be desired by companies notified to use the subways as above upon the application of such companies.

Adopted, all voting "aye," except Mayor Hewitt, who declined to vote.

The following resolutions, offered by Commissioner Gibbens, was unanimously adopted:

Resolved, That the Corporation Counsel be requested to advise this Board whether, in his opinion, further notice than the above is required to be sent by this Board to companies operating electrical conductors in the above named localities, to enable the authorities of the City to cause the removal of the poles and other fixtures from the said streets, provided the same are not removed within ninety days as required by the said notice.

On motion of Commissioner Moss the Board thereupon adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Tuesday, October 4, 1887, at 12 o'clock noon.

Present: Mayor Abram S. Hewitt, Commissioner Jacob Hess, President; Commissioner Daniel L. Gibbens, Commissioner Theodore Moss.

The minutes of the last meeting were read.

Commissioner Gibbens moved a correction of the minutes at page 5, line second, by substituting the word "customers" in place of the word "consumers." With this correction they were approved.

The following opinions from the Corporation Counsel were read and ordered to be spread on the minutes:

LAW DEPARTMENT,

OFFICE OF THE COUNSEL OF THE CORPORATION.

NEW YORK, September 23d, 1887.

THEODORE MOSS, Esq., Secretary Board of Electrical Control:

SIR:—I received your letter of September 21st enclosing the form of notice proposed to be sent by your Board to companies operating electrical conductors in relation to the removal of poles, etc., and requesting me to advise whether any further notice is required to be sent by the Board.

The notice prepared embodies the provisions of the statute, and, in my opinion, is sufficient, and no further notice will be required.

I remain,

Yours respectfully,

MORGAN J. O'BRIEN, Counsel to the Corporation.

LAW DEPARTMENT,

OFFICE OF THE COUNSEL TO THE CORPORATION.

NEW YORK, October 3d, 1887.

THEODORE MOSS, Esq., Secretary Board of Electrical Control:

SIR:—I have received your letter of the 22d instant transmitting the resolution of your Board which requests "the opinion of the Corporation Counsel on the question of the legal status of the North and East River Railway Company, and the right of the company to construct a line of railroad from Burling Slip, by way of South and Fulton streets to West street, then southerly to the ferry station of the Pennsylvania Railway, and, in connection therewith, an electrical conduit for the transmission of power to be applied to the propulsion of its cars and lighting, heating and signally for the same."

An application by the company named to your Board for permission to lay along the line of the railway an electrical conduit for the transmission of power to be applied to the propulsion of its cars, is transmitted with your letter. I therefore infer

that the inquiry of the Board concerns chiefly its jurisdiction over the proposed conduit to be built by the company, and the propriety of granting the permit requested.

The company has been incorporated pursuant to the provisions of Chapter 252 of the Laws of 1884, for the purpose of constructing and operating a railroad upon the streets above named.

The franchise which is claimed to be the property of the company was sold by the city authorities at public auction on the 31st day of May, 1887, and was purchased by the corporation above named.

Bonds have been filed with the Comptroller, as required by the terms of the sale, and approved by him July 11th, 1887, and the company thereby acquired the right to construct, maintain and operate its street railroad in the streets named, upon certain terms and conditions prescribed in the resolution of the Common Council passed December 1st, 1886.

Amongst the terms and conditions imposed by the resolution of the Common Council is the following:

"6. The plan upon which the North and East River Railway shall be built and operated are those of the Bentley-Knight Electrical Railway Company, and are described as follows: The plant consists of a stationary source of power, engines, boilers, and dynamo electrical machines which may be located at an extreme end of the line, at tide water, or at a station; the conduit running from the source of power to and along the whole length of the line contains stationary and permanent conductors, which receive and distribute the electrical currents to the motors placed under the cars and in the wheels or axles; and a depending conductor which passing through a slot in the conduit, and sliding in contact with the stationary conductors maintains unbroken connection with the source of power."

The Bentley-Knight system of electrical railway, which the company is authorized and directed to use by the terms of the resolution of the Common Council, requires the construction of the conduit for which permission is asked.

The question then arises: Has the Board of Electrical Control any jurisdiction of the subject matter of constructing such conduit?

The powers and jurisdiction of the Board of Electrical Control are prescribed and defined by the acts, chapter 534 of the laws of 1884, chapter 499 of the laws of 1885, chapter 503 of the laws of 1886 and chapter 716 of the laws of 1887.

The act of 1884 was intended to secure the removal of all telegraph, telephonic and electric wires and cables from the surface of all streets and avenues in the cities within the terms of the act. It is limited to telegraph, telephonic and electrical light wires and cables, and embraces only corporations, associations, or persons owning or controlling electric wires placed above the surface of the streets.

The act of 1885 provides for the appointment of a Board of Commissioners of Electrical Subways charged with the duty of enforcing the provisions of the act of 1884.

The object and purpose of the act of 1884, supplemented by the act of 1885, is to secure the removal of existing telegraphic, telephonic and electric light wires from above the surface of the streets, and to prevent the maintenance above the surface of the

streets of all wires in future whenever, within the judgment of the Board, such a result is practicable.

The act of 1885 declares the policy and the purpose of the act, "which is to convert the overhead system of electrical wires and cables, now in use, to an underground system, as soon as possible without impairing the efficiency of their service, to require that, as far as practicable, all electrical conductors in any street, avenue or other highway of any such city to be removed from the surface and placed and operated underground, as soon as may be consistent with the convenient use of them by the public."

The act of 1887 is supplementary to the acts of 1884 and 1885; it creates the present Board of Electrical Control and confers upon it the powers possessed by the commissioners of the Board of Electrical Subways.

The Act is entitled "An Act in relation to electric conductors in the City of New York," thus bringing within its terms not only conductors used by telegraph, telephone and electric light companies, but also every kind of conductor for carrying electricity within the city.

Section 4 of the Act provides: "It shall be unlawful after the passage of this act for any corporation or individual to take up pavements of the streets of said city, or to excavate in any of said streets for the purpose of laying under ground any electrical conductors unless a permit, in writing therefor, shall have been first obtained from the said Board or its predecessors."

It is, therefore, made necessary that any corporation or individual, however their rights may have been acquired, shall procure the permit of your Board before taking up the pavements of the streets, or excavating therein for the purpose of laying electrical conductors.

It therefore seems to me that the Board of Electrical Control is vested with such jurisdiction in the premises that its permission is necessary to be given before the applicant company can construct the proposed conduit.

Since the company has acquired the franchise by purchase and complied with the conditions thereof, it is entitled to a permit to construct such a conduit as is necessary in order to operate its railway upon the plan of the Bentley-Knight Electrical Railway Company, and the Board of Electrical Control should, therefore, grant the permit, imposing such prudential regulations in relation to the methods of construction as may seem proper, provided only, that such regulations shall not be inconsistent with the construction and operation of the road upon the Bentley-Knight plan.

In arriving at the conclusion which I have hereinbefore expressed I have not overlooked the protest which has been transmitted to me in behalf of the 23d Street Railway Company.

It is claimed by that company that through its lease from the Bleecker Street Railway Company it has acquired an exclusive right to operate a surface railway on Fulton street, and that it is contrary to the provisions of Sec. 14 of Chapter 222, Laws of 1884, for another company to interfere with such rights.

The applicant company has purchased from the city a franchise to construct and operate its railroad upon the streets named, and it is not the province of your Board to determine in relation to any conflict of rights claimed to exist between it and a rival company.

Your permit will not conclude the 23d Street Company, in any manner, and the court will redress and protect its rights.

In the 34th Street Railway matter, 102 N. Y. Rep., 354, a similar point was urged in opposition to an application to appoint commissioners.

The court, however, held that the existence of a prior right to the streets was no reason for refusing the application, because such right was only a present obstacle to the exercise of the franchise, not an insurmountable difficulty.

So, in the matter under consideration, if it be the fact that the applicant company is under the necessity of procuring the consent of the 23rd Street Railway before it can occupy a portion of the street such fact furnishes no reason for the refusal of your Board to issue the permit applied for.

I remain,

Yours respectfully,

MORGAN J. O'BRIEN, Counsel to the Corporation.

The following communication from the Consolidated Telegraph and Electrical Subway Company and proposed rules of said company were read:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL

SUBWAY CO., 18 CORTLANDT STREET,

NEW YORK, October 4th, 1887.

THEO. MOSS, Esq., Secretary of Board of Electrical Control:

DEAR SIR:—In compliance with the resolution of your Board, passed on 8th ultimo, I beg to submit herewith the rules and regulations which this company recommends for the governing of the subways, and shall be glad to have the same approved by your Board as early as convenient.

Yours respectfully,

WILLIAM J. SEFTON, Secretary.

Rules and regulations governing the occupancy of the subways of the Consolidated Telegraph and Electrical Subway Company.

First. All applications for space in the subways to be made in writing, giving the name of the company, the number and length of conduits wanted, the purpose for which they are to be used; the size, number and length of the conductors to be placed in the same, whether singly or in cables, the kind, strength and quantity of current to be used, and such other specific information as will fully explain the use intended and

method of such use. The application must also state the term for which the conduits are wanted. All conductors to be used with a current of not exceeding volts must have an insulation with a resistance of not less than megohms per mile with an additional insulation resistance of megohms for each additional volts of current, and a guarantee satisfactory to the Subway Company must be given by the manufacturer of such conductors before they can be used.

Second. All conductors shall be placed in the subways by the lessee, unless otherwise mutually agreed upon. No company or its employees shall have access to the subways or to any manholes unless in the presence of an inspector of the Subway Company. All work in the manholes must be approved by and be satisfactory to the inspector of the Subway Company, who shall have authority to require such alterations as he may deem fit, for the safety of the cables or wires of other companies or the convenience of other companies. All repairs to conductors or cables must be made by the companies owning them immediately upon notice, and during such repairs all precautions necessary in the judgment of the Subway Company must be taken for the protection of other companies' wires.

Third. All alterations of or additions to the subways for the purpose of connecting wires therein with points outside will be made by the Subway Company upon the request of the company desiring the same, provided the same have been authorized by the Board of Electrical Control, and the expense of making such additions or alterations is satisfactorily guaranteed by the persons or companies desiring them.

Fourth. The Subway Company will not be responsible for any damage arising from any cause whatever to persons or property by reason of the conductors. It will use every reasonable precaution to prevent damage of any kind from any cause within its control.

Fifth. Rental to be paid yearly in advance. Applicants will be required to enter into a written contract with satisfactory guarantees for its performance.

Sixth. The Subway Company reserves to itself the right to add to or amend these rules and regulations from time to time as may be necessary, subject to the approval of the Board of Electrical Control.

Office of the Consolidated Telegraph and Electrical Subway Company, 18 Cortlandt street, New York.

October 3d, 1887.

Commissioner Gibbens moved the following resolution:

Resolved, That these "rules and regulations governing the occupancy of the subways of the Consolidated Telegraph and Electrical Subway Company" be referred to Mr. Park Benjamin, and that he be requested to fill in the blanks which are left in them, and to make any suggestions as to alterations or additions to these rules and regulations which may seem to him, from an electrical standpoint, to be necessary.

Adopted: Commissioners Hess, Gibbens and Moss voting "aye." Mayor Hewitt "no."

The following communication from the Consolidated Telegraph and Electrical Subway Company was referred, without objection, to the engineer:

THE CONSOLIDATED TELEGRAPH AND

ELECTRICAL SUBWAY COMPANY,

No. 18 CORTLANDT STREET,

NEW YORK, October 4th, 1887.

To the Honorable, the Commissioners of the Board of Electrical Control:

GENTLEMEN:—We respectfully request your honorable Board to authorize the construction of the following electrical subways:

First. The construction of a subway on 18th street extending from 1st avenue, to 7th avenue, connecting at Broadway and 6th avenue with the existing subways. This subway will provide facilities for telephone and telegraph service, and is shown in detail on the map submitted herewith. It is important to complete this line before winter in order to effect the transfer of the telephone exchange at 21st street to the new telephone exchange established at 18th street and Broadway, and also to connect the latter with the district covered by this line.

We recommend for this subway the same construction as that adopted on Broadway, namely: iron pipe laid in hydraulic cement concrete.

Second. The construction of a subway on John street, extending from Nassau street along John street, across Broadway, connecting with the new subway at Dey street. This subway will give telephone and telegraph service, and is shown in detail on the map submitted herewith. This construction will enable the transfer of the John street telephone exchange to the new telephone building in Cortlandt street, and will assist largely in utilizing the new subway on Broadway and Cortlandt street.

We recommend for this subway the same construction as adopted on Broadway, namely: iron pipe laid in hydraulic cement concrete.

Third. The construction of subways for an electric light system covering a district extending from Madison avenue to 8th avenue, and from 45th street to 59th street, as shown in detail in the map submitted herewith. The electrical subways in this district will consist of iron pipe laid in hydraulic cement concrete, together with the Edison iron pipe laid in the same trench above the former.

Fourth. The obstructions discovered in sinking test holes on the line authorized at the corner of Broad and Beaver streets, show that the existing pipes and sewers prevent the construction of a subway as large as the one projected. We respectfully request your Honorable Board to allow us to lessen the number and the size of the ducts on the lines authorized above and to carry the balance of the ducts along other streets in the vicinity, as shown on the map submitted herewith.

The method of construction of this section would remain as authorized by your honorable Board.

We respectfully ask that your honorable Board will take action without delay upon the requests contained in this communication, in order that by obtaining materials immediately the work may be completed this year and the pressing needs for electrical service in the districts named may be supplied.

I have the honor to remain

Very respectfully,

LEONARD F. BECKWITH, Chief Engineer.

The following letter from Gen. Newton to President Hess and President Hess' reply thereto were then read:

DEPARTMENT OF PUBLIC WORKS,

COMMISSIONER'S OFFICE, No. 31 CHAMBERS STREET,

NEW YORK, September 26, 1887.

JACOB HESS, ESQ., Chairman Board of Electrical Control:

SIR:—My attention has been called to the following excerpt from the minutes of a meeting of the Board of Electrical Control at the office of the Mayor, Thursday, September the 8th inst.:

"President Hess said that he thought attention ought to be called to the fact that the Department of Public Works appointed nineteen inspectors for work that did not cover perhaps half a square mile in extent. It is claimed that this Board has no right to appoint anybody except he goes through a civil service examination, but these men do not go through civil service."

I would be much obliged if you would kindly give me the dates of appointment and location of the work of these inspectors, as it is on record in this Department that no inspectors have been appointed unless asked for by the officers of your Board.

Very respectfully,

JOHN NEWTON,

Commissioner of Public Works.

SEPTEMBER 30, 1887.

GEN. JOHN. NEWTON, Commissioner of Public Works, New York City:

DEAR SIR:—In reply to yours of 26th relating to my remarks at one of our Board meetings "about nineteen inspectors of your Department being placed on our

work of construction of electrical subways unreasonably near together—within an area of about one-half mile,” I will correct my statement of the number, and, instead of nineteen, say sixteen watching our work about the first of September, between the district included within Eighteenth and Thirty-second streets and Broadway and Sixth avenue.

I am not aware of any officers of our Board asking for the appointment of inspectors, and will be glad to hear from you on the subject, unless it be that asking for permits to open streets includes asking for an inspector.

I send herewith as requested a list of the inspectors and the date of appointment, with a map showing the location of the work and the numbers on the map showing where the several men were assigned to duty by your Department.

It must appear to you from the accompanying map of the location of the work that these inspectors, namely: sixteen men between Eighteenth and Thirty-second streets and Broadway and Sixth avenue watching the relaying of pavement, when our force of workmen were only relaying pavement in four places at the same time, was more than the requirements of the case would warrant.

Very respectfully,

JACOB HESS.

The following application from the East River Electric Light Company was read:
To the Board of Electrical Control:

SIR:—The East River Electric Light Company respectfully applies for permits to erect lamp posts on the following streets and avenues, as particularly designated on the map, filed by them with the clerk of the Gas Commission, subject to modification by your Department. The erection of said lampposts being necessary in order to carry out the contract which has been awarded by the Gas Commission to the East River Electric Light Company.

EAST RIVER ELECTRIC LIGHT COMPANY,

By JOHN J. MOORE, Manager.

September 20, 1887.

Park Row, 14 lampposts.

Bowery, 20 lampposts.

Third avenue, between Seventh and Eighty-sixth streets, 87 lampposts.

Grand street, between Broadway and East River, 30 lampposts.

Sixth avenue, between Carmine and Fifty-ninth streets, 51 lampposts.

Eighth avenue, between Fourteenth and Fifty-ninth streets, 46 lampposts.

Tenth avenue, between Fourteenth and Fifty-ninth streets, 41 lampposts.

Centre street, Printing House Square to Grand street, 13 lampposts.

Desbrosses street, Canal to North River, 5 lampposts.

Christopher street, between North River and Sixth avenue, 11 lampposts.

Eighth street, between Sixth avenue and Cooper Union Square, 8 lampposts.

Fourth avenue, between Fifth and Fourteenth streets, 7 lampposts.

Avenue B, between Houston and Fourteenth streets, 12 lampposts.

Avenue D, between Houston and Fourteenth streets, 11 lampposts.

First avenue, between Houston and Fourteenth streets, 12 lampposts.
West Broadway and South Fifth avenue, 22 lampposts.
Stuyvesant street, between Eighth and Tenth streets, 44 lampposts.
Tenth street, between Second avenue and East River, 15 lampposts.
Houston street, from North to East River, 39 lampposts.

The following resolution was offered by Commissioner Gibbens:

Resolved, That whenever hereafter any company shall be permitted by this Board or its successors to erect posts or poles or other fixtures bearing lamps or other devices for the purpose of lighting by electricity the streets, avenues, highways, parks or public places of the City, the said permission shall be granted only subject to the following provisions, and the same is hereby expressly made a condition of said permits.

At any time when by action of the City authorities the contract for lighting any such street or other public place shall be given to another company, the company erecting said lighting fixtures or lampposts shall, on tender of the first cost thereof, yield possession and ownership of the same to the said other company obtaining the new contract.

Adopted, Mayor Hewitt voting "no."

Commissioner Gibbens offered the following resolution:

Resolved, That whenever it appears that an electric light company has a contract to light a street or streets for the City signed before the 15th of October, 1887, and neither the said company nor any other electric light company has wires, poles or other fixtures in the said street or streets, and no subway for electric light wires is prepared in said street or streets, the following is the part of the general plan of this Board for said locality and service.

Upon notice from said company and the filing with the engineer of the Board of plans and maps of the locality showing places where said company is to place lampposts to carry out said contracts, and other connections desired, the Construction Company shall at once proceed to construct, under the supervision of the engineer of the Board, a subway in accordance with attached plan and specifications, and shall allow the said electric lighting company to place therein conductors having an insulation with a resistance of 600 megohms a mile under immersion during 48 hours.

As the laying of said subway is progressing, making such provisions for connection therewith as shall be called for by the aforesaid and following plans.

Points at which said insulated wires or cables are joined must be insulated in the same manner as the remainder of the Windsor cables and by the manufacturers, whose certificate of test will be required for all wires or cables laid.

SPECIFICATIONS.

A box of yellow pine with an inside measurement of four inches by six, laid at an average of twelve inches below the surface of the street, in such part of the street as may be designated in permits of the Department of Public Works, substantially as described in accompanying plan and sketch.

President Hess moved to lay the resolution on the table. Motion lost; Mayor Hewitt and President Hess voting "aye," and Commissioner Gibbens and Moss voting "no."

The Board then voted on the resolution, and it was lost, Commissioner Gibbens and Moss voting for it, Mayor Hewitt and President Hess against it.

The following resolution, proposed by Commissioner Gibbens, was unanimously adopted:

Resolved, That the request made to the Corporation Counsel by this Board for an opinion as to the authority of the Board to compel companies owning poles in the City to submit to have the same used by other companies be respectfully recalled and the following request substituted:

In view of the franchises and permits granted to electric lighting companies by the local authorities, and the reservations therein to electrical conductors in the City of New York and of the powers of this Board, is it within the province of the Board to compel electric lighting companies having such franchises and permits and poles erected in pursuance thereof, to allow said poles to be used by other electric lighting companies having contracts to light the streets occupied by said poles, provided, it appears to the Board that the erection of other poles in said streets would be contrary to public interests, and that no other method of enabling said companies to carry out said contracts with the City is practical at this time, and that said contracts are for the public good, and that the said use of the said poles will not interfere materially with the use thereof by the owner companies, but is in the nature of a reasonable regulation compatible with that use.

Commissioner Gibbens also offered the following resolution:

Resolved, That whenever it appears that an electric light company has a contract to light a street or public place for the City, entered into before the 1st of November, 1887, and there are in such street or public place poles or other supporting fixtures, and no subways for electric light conductors is prepared in said street or public place by order of this Board, upon notice from said company to that effect the Secretary of the Board is authorized to issue to said company permission to stretch wires or cables necessary to carry out said contract upon the said poles or other supporting fixtures already existing in said street, provided the said company can secure permission from the owners of the same to use them for this purpose subject to the rules and regulations of the Board.

A motion made by Mayor Hewitt to lay this resolution on the table was lost, Mayor Hewitt and Commissioner Moss voting "aye," Commissioners Hess and Gibbens "no."

The resolution was then lost, Commissioners Hess and Gibbens voting for and Commissioner Moss against it; Mayor Hewitt declining to vote.

The Board ordered the following communication from the President of the U. S. Illuminating Co. spread on the minutes:

NEW YORK, October 3d, 1887.

To the Board of Electrical Control:

GENTLEMEN:—We beg to acknowledge the receipt of a notice and copy of resolution, by which your Board directs the owners or operators of electrical conductors above ground in Broadway from 34th to 14th streets; in 23d, 24th, 25th, 26th, 27th and 28th streets, from Fifth to Sixth avenues; in 19th and 21st streets, from Broadway to Sixth avenue, to make such electrical connections in said streets, with the underground conduits or subways there constructed, as may be necessary to the proper transaction of their business, and to submit to your Board "plans of said electrical connections" authorized by the resolution, "together with modifications of or additions to said conduits, necessary or desired so to be, for making the same."

We enclose a map showing the points of distribution and the electric connections necessary in the localities mentioned, to enable this company to transact its business with its present customers. Future connections may be required at any time with any house or building on the route.

We find it difficult and indeed doubt if it be practicable, to make connections with the conduits now laid, in such a way as to enable the company to transact its business with the underground conductors, without impairing the efficiency of the present service and depriving the public of the convenient use of our lights.

We beg, therefore, to suggest that before making a definite and final decision to the effect that the present construction of conduits complies with the condition of the law, your Board should direct the Consolidated Telegraph & Electrical Subway Company to make subsidiary connections in those portions of the streets designated in your notice, and indicated on the inclosed plan, that will cause the least public inconvenience, and there to test the efficiency of the underground system for a sufficient length of time to establish the fact that it is a safe substitute for the overhead system, and will not impair the efficient service of the latter.

If it is contemplated that the work of the Consolidated Telegraph & Electrical Subway Company, in making the subsidiary connections referred to, will impose any charge or expense upon this company, we respectfully request that you inform us of the amount of such expense, and of the rental per lineal foot of subways and subsidiary connections.

We do not intend by this communication to authorize work by the Consolidated Company at the expense of this company.

Very respectfully yours,

EUGENE T. LYNCH, Pres.

The following statement will show the streets, parks and public places to be lighted by electric lights under the late awards made by Gas Commission:

Brush Electric Illuminating Co.—Broadway, 14th street to 59th street; Fifth avenue, 14th street to 59th street; Fourth avenue, 18th street to 34th street; Park avenue, 34th street to 42d street; Seventh avenue, 14th street to 59th street; 14th street, North River to East River; 23d street, North River to East River; 42d street, North River to East River; 34th street, North River to East River; 59th street, 3d avenue to 9th avenue; Madison Park and Union Park.

The above is present district Brush Co.

United States Illuminating Co.—Bleecker street, Bowery to 8th avenue; Broadway, Battery Place to Canal street; Canal street, Bowery to North River; Catharine street, East Broadway to East River; Chambers, Broadway to North River; East Broadway, Chatham Square to Grand street; Fifth avenue, Washington Square to 14th street; Fulton street, North River to East River; South street, Whitehall street to Grand street; West street, Battery Place to W. 11th street; Battery Park, City Hall Park; Tompkins Park, Gansevoort Market Square; Washington Square Park; Barclay street, Broadway to West street; Chambers street, Broadway to East River; Cortlandt street, Broadway to West street; Whitehall street, Bowling Green to South Ferry.

East River Electric Light Company—Broadway, Canal to 14th street; 8th avenue, 14th street to 59th street; Park Row, Ann to Bowery; Bowery, Park Row to 3d avenue; 3d avenue, Bowery to 86th street; Grand street, Broadway to East River; Avenue B, Houston to 14th street; Avenue D, Houston to 14th street; 1st avenue, Houston to 14th street; 4th avenue, Bowery to 14th street; Centre street, Brooklyn Bridge to Grand street; Christopher street, Sixth avenue to West street; Desbrosses street, West to Canal street; 8th street, 6th avenue to Cooper Union; Houston street, North River to East River; Stuyvesant street, 8th street to 10th street; 10th street, 2d avenue to East River; 10th avenue, 14th street to 59th street; West Broadway and South Fifth avenue, from Chambers to Washington Square.

Mount Morris Electric Light Company—Greenwich street, Battery Place to Warren street

Harlem Lighting Company—3d avenue, 86th street to 130th street; 8th avenue, 121st street to 155th street; 125th street, East River to Manhattan street to North River; Mount Morris Park; Harlem Bridge (3d avenue).

American Electric Manufacturing Company—Boulevard, 110th street to 155th street; 110th street, Boulevard to St. Nicholas avenue; 6th avenue, 110th street to 136th street.

North New York Lighting Company—3d avenue, Harlem Bridge to Willis avenue; 138th street, 3d avenue to Madison Avenue Bridge.

Engineer Kearney made a report in favor of granting the applications of the Manhattan District Telegraph Company, which were referred to him at the last meeting.

Commissioner Gibbens moved that the permits asked for in the applications of the Manhattan District Telegraph Company be granted. Lost. Commissioners Moss and Hess voting no, Mayor Hewitt declining to vote.

Engineer Kearny reported favorably on the application of the North and East River Railway Company referred to him at the last meeting, and stated that, as directed by the resolution of reference, he had consulted with Professor Plymton, who said that if a like application was made to his Board he would not hesitate to grant the permission.

Commissioner Gibbens offered the following resolution:

Resolved, That, in the matter of the application of the North and East River Railway Company, the Engineer be requested to suggest to the Board such reasonable regulations as it may seem to him the Board should insist upon in granting the permit asked for by that company; and, in order that he may have the benefit of expert electrical advice on the subject, he be empowered to consult Professor Plymton again in the matter.

Mayor Hewitt offered the following substitute, which was unanimously adopted:

Resolved, That permission be granted to the North and East River Railway Company to proceed with the work of establishing a conduit, subject to such regulations as this Board may see fit hereafter to adopt to insure the safety of the public.

The Board, on motion of Commissioner Gibbens, adopted the following resolution, all voting "aye" except Mayor Hewitt, who declined to vote:

Whereas, in the opinion of this Board a sufficient construction of conduits or subways under ground has been made ready, reference being had to the general direction and vicinity of the electrical conductors in use overhead in the following streets and localities of the city, to wit: Broadway from Cortlandt street to Vesey street, and thence through Park Row to the Brooklyn Bridge; therefore be it

Resolved, That the Secretary be directed to notify the owners or operators of the electrical conductors above ground in said streets or localities to make such electrical connections in said streets with such underground conduits or subways as may be necessary to the proper transaction of their business, and to place electrical conductors for the transaction of their business in the said conduits, and to remove poles, wires or other electrical conductors above ground and their supporting fixtures or other devices from the said streets and localities within ninety days after the receipt of this

notice. And said companies are further notified to submit plans of said electrical connections hereby authorized, together with modifications of or additions to said conduits necessary, or deemed so to be, for making the same, to this Board, within ten days, or as soon thereafter as possible, so that this Board may cause the said modifications or additions to be made, if they appear to be proper and necessary; and, in case the said suggestions for the modification of or additions to said conduits are not submitted to the Board, or do not appear to the Board to be proper and necessary, the following methods are designated by the Board for the making of the said electrical connections in the said streets: For electric light and power conductors, subsidiary iron tubes from the nearest manhole in said subway to the point desired to be reached, and through said iron tubes insulated wires or cables connecting the lights, machinery or termini of overhead lines with electrical conductors in the said conduits. For other service, subsidiary iron pipes or boxes either of wood or iron, extending from the nearest manhole to the point desired to be reached, with insulated conductors connecting the instruments or termini of overhead routes with the wires in the said conduits. The Consolidated Telegraph and Electrical Subway Company is authorized and directed to construct said subsidiary ducts or boxes at such places as shall be desired by companies notified to use the subways as above upon the application of such companies.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Secretary be directed to inquire of the Western Union Telegraph Company why the poles along the line of the Third and Ninth avenue Elevated Railroad structures have not been taken down, and how soon they will be taken down.

Adopted unanimously.

Resolved, That the Secretary be directed to inquire of the Metropolitan Telephone and Telegraph Company why it is that the old poles along the Tenth avenue route and along Forty-fifth street are not removed.

Adopted unanimously.

The Board thereupon adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, October 20th, 1887, at 12 o'clock, noon.

Present: Mayor Abram S. Hewitt, Commissioner Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read.

Commissioner Gibbens moved to correct the minutes at page 15, line 24, by substituting a comma in place of the period after the word "hours," and connecting the succeeding paragraph as part of the preceding sentence. The minutes, with this correction, were then approved.

The following opinion from the Counsel to the Corporation was read and ordered to be spread upon the minutes:

LAW DEPARTMENT,

OFFICE OF THE COUNSEL TO THE CORPORATION,

NEW YORK, July 27th, 1887.

HON. ABRAM S. HEWITT, Mayor, &c.:

SIR:—I am in receipt of your communication of July 25, 1887, transmitting two resolutions adopted by the Board of Electrical Control on the 15th inst; in one case involving the question of the possible interference of the subways with gas pipes, and in the other referring to the form of permission to be granted to certain electrical companies.

The resolution first above referred to requested the Mayor to call upon the Counsel to the Corporation for an opinion as to whether any municipal authority or the Board of Electrical Control has the power to order the removal of gas pipes from the route laid out by the Board for any subways; and it is stated in the resolution that the purpose of submitting this question to the Counsel to the Corporation is in order that the question may be decided for the municipal authorities, and thus the Board of Electrical Control may earlier know their position in the premises.

All of the gas pipes now laid in the City of New York have been laid under legislative authority, and with the exception of those recently laid by the Standard Gas Company have, I think, in every instance been laid with the approval and consent of some municipal authority, but this fact does not, in my opinion, relieve them from the obligation to make such changes in the location of their pipes as the public convenience or security may require.

Matter of Deering, 93 New York, 361.

I am therefore of the opinion that it is within the power of the Board of Electrical Control to compel the removal and relocation of gas pipes, where such removal is found to be necessary in order to enable the Board to perform the duties imposed upon it by the Legislature, and in case of the failure or refusal of any company so to remove and relocate its pipes, it is, in my opinion, within the power of said Board so to remove them, due and reasonable notice and opportunity to make such removal and relocation having first been given to the company or companies owning the pipes to be moved.

The second resolution provides that the matter of the form in which permission shall be granted to electrical lighting companies to have wires in the City of New York be referred to the Mayor, and that he be requested to report thereon at the next meeting of the Board. You have accordingly transmitted to me a typewritten document headed "Proposed Form," and you state in your letter that this is the form of permission to be granted to the new electrical lighting companies, who, prior to the formation of the Board of Electrical Control, had authority from the City to establish lines along the streets, and you state that the question submitted to me is whether the form provided is sufficient to protect the interests of the City, so far as there is any power to do so.

The form submitted with your letter appears to me to be sufficient in the case of any company organized under either of the acts recited in it, and which has not obtained a franchise or privilege from the Board of Aldermen to establish lines along the streets. It will not cover the case of a company organized under the General Telegraph Act, as some of the companies now operating electrical conductors in this City are organized; and it will not, in my judgment, protect what I understand to be the interests of the City in the matter of the particular electrical lighting companies to whom permits or franchises were given by the Board of Aldermen, prior to the formation of the Board of Electrical Control. The reason for this opinion is, that under the permit submitted to me, none of these electrical lighting companies will be able to furnish light until a considerable extent of subway has been constructed. You will perceive that the proposed permit in its first paragraph authorizes the company to be named in it to "lay, erect and construct suitable wires or other conductors, with the necessary poles, pipes or other fixtures, in, on, over and under streets, avenues and public parks and places of the City of New York." If this were the whole substance of the permit, it would doubtless achieve the purpose which you had in mind when you addressed the letter to me; but this apparently wide permission is qualified by the proviso which follows immediately after, in these words: "Provided always, and this consent is given upon these express conditions and not otherwise, that until the further order or resolution of this Board, the electrical conductors of said company shall not be laid, erected or constructed, nor shall any of the privileges above granted be exercised otherwise than, or except in subways constructed by the Consolidated Telegraph and Electrical Subway Company, under and in pursuance of the provisions of the Act, Chapter 716 of the Laws of 1887, under and in pursuance of the supervision of this Board, to be leased to said company by the Consolidated Telegraph and Electrical Subway Company."

As I have already said, the form proposed appears to be sufficient for the particular class of companies described in it; but, in view of what seems to me to be its inapplicability to electrical lighting companies who have offered to contract with the City for lighting the streets, I may be permitted to suggest that it is doubtful whether a universal form of permit, to be applied to all companies, will be found to be expedient or feasible. There would seem to be some reasons why special forms of permit should be issued to companies who have contracted with, or who are ready to contract with, the City for street lighting at low prices.

Yours very truly,

MORGAN J. O'BRIEN, Counsel to the Corporation.

Engineer Kearny submitted to the Board the following report:

NEW YORK, October 20th, 1887.

To the Honorable, the Commissioners of the Board of Electrical Control:

GENTLEMEN:—I would respectfully recommend a construction of subways as soon as possible in the following streets:

Broadway, from Exchange place south to Whitehall street and Stone street, through Stone to Beaver street, consisting of iron pipe laid in hydraulic cement. This is a change of construction already ordered in this district from Broad street to Broadway, and from Beaver street to Stone street, it having been found by digging test holes that it was impossible for us to find the necessary space in Beaver street and in Broad street for the size of subway required in that district.

I have also to request the Board to authorize the construction of a subway across Broadway at John street, extending down John street 100 feet easterly, consisting of iron pipe laid in hydraulic cement, as per plan, in order to reach the Telephone Exchange in John street.

Also the construction of a subway in 18th street, from First avenue to Seventh avenue, consisting of iron pipe laid in hydraulic cement, as per plan.

Also the construction of a subway, to consist of iron pipe laid in hydraulic cement, as per plan, in 38th street, from Lexington avenue to Eighth avenue.

The above mentioned work is necessary additions to the sections of work already authorized in their respective neighborhoods.

I also recommend the construction of subways in the various streets and avenues, or parts of streets and avenues, in the district between 45th and 59th streets, Lexington to Eighth avenue, as per plan. The requirements of the various electrical companies in this district, as far as can be ascertained to date, have been provided for.

Very respectfully,

HENRY S. KEARNY.

Commissioner Gibbens moved the following resolution:

Resolved, That the plan recommended by the Engineer, marked "October 20, No. 1," be adopted.

Adopted, all voting "aye" except Mayor Hewitt, who declined to vote.

Plan marked "October 20, No. 2," laid over.

Resolved, That the plan shown on the map, marked "October 20, No. 3," be approved.

Adopted, same vote as before.

Resolved, That the work indicated on the plan, marked "October 20, No. 4," be approved.

Adopted. Mayor Hewitt declined to vote.

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Resolved, That the work which is indicated on a map, marked "October 20, No. 5," be approved.

Adopted, Mayor Hewitt alone voting "no."

The following communication from John D. Crimmins was read and ordered to be spread on the minutes:

OFFICE OF JOHN D. CRIMMINS,
1043 THIRD AVENUE,
NEW YORK, October 13, 1887.

HON. JACOB HESS, City:

DEAR SIR:—From time to time I have noticed in the papers that in the construction of subways miles of streets are opened.

To-day I have had a careful survey made of all the streets opened under permission of your Honorable Board, and find that the total length of streets and pavements in a disturbed condition is 4,486 feet.

This includes all work relative to the subways and the Edison system.

I beg to call your attention to this fact to show how close the work is completed after the streets are opened. I may add that there are nineteen places in which pavements are disturbed.

The shortest measurement taken is five feet, and the greatest length, on Sixth avenue, is 540 feet.

Very respectfully,

JOHN D. CRIMMINS.

The following communication from Leslie W. Russell was read, and the Board ordered the Secretary to acknowledge the receipt of same.

October 10, 1887.

The Board of Electrical Control:

GENTLEMEN:—It has come to the information of the 23d Street Railroad Company, which holds the Bleecker Street Company under a lease, that it has been referred to your Honorable Body to pass upon the question as to the propriety of granting a permit to an electrical motor company to lay a conduit in Fulton street, and that this company claims that some partial or other consent has been given by the 23d Street Company or the Bleecker Street Company to the laying of a track and the conduit.

Permit me, as counsel for the 23d Street Company, by direction of its President, Mr. Arthur Leary, to say that no such consent has ever been given, and that repeated communications have been made on behalf of the Motor Company to obtain such consent, which have been invariably refused.

Allow me, also, to call your attention to the physical situation which precludes the passage of cars by the two companies, the necessary blockade of the street in

case another company were allowed to run, the impossibility under the law of a second surface company exercising the franchise in a street already occupied by another company, where the distance exceeds 1,000 feet, and the law bearing thereon.

Laws of 1884, Chapter 252, Section 214. Matter 34th Street Company (102 N. Y., 345).

Any further information I should be happy to give the Board if desired.

Yours very respectfully,

LESLIE W. RUSSELL.

The following communication from the Consolidated Telegraph and Electrical Subway Company was read:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY COMPANY,

No. 18 CORTLANDT STREET,

NEW YORK, October 14th, 1887.

COL. H. S. KEARNY, Chief Engineer Board of Electrical Control, 1218 Broadway:

DEAR SIR:—I beg herewith to hand you a copy of map showing connection at Thirty-second street with Sixth avenue subway, to be built for telephone purposes. This connection is asked for as a substitute for the one authorized at Thirty-third street and Sixth avenue. Believe me,

Yours truly,

LEONARD G. BECKWITH, Chief Engineer.

Commissioner Gibbens offered the following resolution:

Resolved, That the connection asked for as a substitute for the one at 33d street and Sixth avenue, as shown on the plan marked "Plan showing location of subway for Electrical Conductors, cor. Sixth avenue and 32d street," be granted.

Adopted. Mayor Hewitt declined to vote; all others voted "aye."

The following communication from the Metropolitan Telephone and Telegraph Company was read, and ordered to be spread on the minutes:

OFFICE OF THE VICE-PRESIDENT AND GENERAL MANAGER OF THE

METROPOLITAN TELEPHONE AND TELEGRAPH COMPANY,

No. 18 CORTLANDT STREET,

NEW YORK, October 8th, 1887

Board of Electrical Control, 1218 Broadway, New York:

DEAR SIR:—I have yours of the 7th, calling the attention of this company to the resolution passed by the Board of Electrical Control on the 4th inst., in regard to the old poles on the Tenth avenue route and along Forty-fifth street, and I beg to say that a gang of men are now at work, and have been continuously at work, removing the poles on Tenth avenue above Kingsbridge, and that a gang of men

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have been continually at work on Forty-fifth street transferring the wires from the old pole line to the new poles, and as soon as this is done the old poles will be removed.

I beg to state further that the utmost is being done to put these streets in a condition satisfactory to your Board, but the work has been of such magnitude as to have prevented its being done sooner.

Yours respectfully,

H. S. HUIDEKOPER, Vice-Pres. and Gen. Mangr.

The following other communication from the Metropolitan Telephone and Telegraph Company was read:

OFFICE OF THE VICE-PRESIDENT AND GENERAL MANAGER OF THE
METROPOLITAN TELEPHONE AND TELEGRAPH COMPANY,

No. 18 CORTLANDT STREET,

NEW YORK, October 6th, 1887.

Board of Electrical Control, New York City:

GENTLEMEN:—Yours of September 12th, enclosing a resolution of the Board in relation to telegraphic and telephonic service along 58th street and neighboring streets parallel thereto, between Third and Eighth avenues, was duly received, and I beg to say that cables were immediately ordered by this company to replace the wires which are now overloading the pole line on 58th street, and that this company will be ready to have said cables placed in the conduits as soon as the conduits are completed and a system of distribution prepared which will suit the requirements of our service, and will then remove the poles and wires referred to above, which it is anxious to do before the winter storms set in, and we, therefore, most earnestly beg that you will have that part of the conduit which lies across Fifth avenue completed at an early day, so that measurements may be taken for cables and the cables put in place before frost will interfere with the proper laying and splicing of the wires.

While the resolution does not state that the conduit has been fully completed, but states that a "sufficient construction of underground conduits has been made ready for the accommodation of said service," and we are, therefore, ordered to remove said wires and poles within ninety days from September 12th, I beg to state that it is not deemed practicable by this company to temporarily use part of the conduit and remove its poles, and that it must most earnestly and respectfully demand that the conduit shall be completed so that it may be used with only a reasonable amount of inconvenience, and not to its great detriment and that of its subscribers.

I must, therefore, again most earnestly beg your early attention to the matter of completing the conduit between Sixth and Third avenues.

Yours very respectfully,

H. S. HUIDEKOPER, Vice-Pres. and Gen. Manager.

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The following communication from Park Benjamin was read:

NEW YORK, October 10, 1887.

THEO. MOSS, Secretary Board of Electrical Control, 1218 Broadway, City:

DEAR SIR:—I have to acknowledge your favor of the 7th inst., enclosing copy of resolution passed by the Board of Electrical Control, wherein the rules and regulations governing the occupancy of the subways of the Consolidated Telegraph and Electrical Subway Company are referred to me.

I will give the matter my earliest attention and submit a report thereon.

I am, sir,

Very respectfully,

PARK BENJAMIN.

The following communications from the Harlem Lighting Company were read:

HARLEM LIGHTING COMPANY,

NOS. 242 AND 244 EAST 122D STREET,

NEW YORK, October 20, 1887.

To the Board of Electrical Control:

GENTLEMEN:—Having received a contract from the Gas Commission for the lighting of certain streets in Harlem where we have no poles or wires, as shown in the accompanying maps in blue pencil, we desire to apply for a conduit, and would most respectfully ask your Board to call up the resolution offered at your last meeting, and pass it, so that we can fulfil our contracts with the City and private customers. The writer wishes to say that, having had experience with arc lights in underground conduits, in his opinion it is the only place for them, although the first cost to the company is much greater. The expense for maintenance is practically nothing, while keeping pole wires in repair during winter weather is very expensive, and with the loss in rents fully balance the expense of the underground system.

Very respectfully yours,

HARLEM LIGHTING COMPANY.

JOHN H. HAPGOOD.

OFFICE OF THE HARLEM LIGHTING COMPANY,

NOS. 242 AND 244 East 122d Street,

NEW YORK, October 20th, 1887.

To the Board of Electrical Control:

GENTLEMEN:—This company having received a contract from the Gas Commission, wish to ask your Board for a permit to erect electric light lampposts on Third avenue, from 86th street to 130th street, and on 125th street, from First avenue to Fourth avenue. No poles or wires are needed, we simply require the erection of lampposts as located by the Gas Commission, to enable us to fill our contract with the

City, and to light the principal business part of Harlem. We have presented to your Honorable Board, and also to the Board of Aldermen and Gas Commission, petitions signed by over \$3,000,000 of property owners, asking that Harlem be lighted. We received contracts to light other portions of Harlem which can be seen by the accompanying map, where we have not poles and wires, and we do not ask for any permits there, only in the business portions where we have poles and wires.

Yours very respectfully,

HARLEM LIGHTING COMPANY,

JOHN H. HAPGOOD.

Commissioner Moss asked to have the following resolutions read and spread upon the minutes, and that no action be taken on them for the present:

Resolved, That it is the sense of this Commission that the Legislature, in creating it, intended that it should, with as much rapidity as practicable, cause the poles and overhead wires in this City to disappear; that it was not created to afford facilities for adding to the number of poles and the mileage of wires, and that it is its duty and intention to prevent any addition to the poles and wires, except where such addition is absolutely necessary to prevent a serious interruption of telegraphic, telephonic or electric light business.

Resolved, That the discretion given to this Board to grant permits in certain cases, for the erection of poles and the stringing of wires, was intended to provide for necessary repairs to overhead lines during the construction of the electrical subways; and that by no reasonable or fair construction can it be held to authorize the Commission to grant permits for the building of new overhead lines by corporations which have been organized since the passage of the Subway law, and the incorporators of which have shown no disposition to comply with the law by ever asking that provision be made for their wires in subways; that to permit the building of such lines would be a direct violation of the law which this Commission was created to enforce, and would bring the Board into justly merited contempt.

Resolved, That this Board is ready to order the construction of subways and have them prepared as rapidly as possible for any new company applying for them and offering a reasonable guaranty of rental to cover interest on the investment, but that until such application is made and acted upon, no such company shall be regarded as having any claim upon the attention of the Board, and no application from such company for permission to erect poles and string wires shall be considered.

Mayor Hewitt offered the following resolution:

Resolved, That the editorial of the New York Times of this morning on the same subject be published.

Lost; Mayor Hewitt and Commissioner Moss voting "aye," and Commissioners Hess and Gibbens "no."

Commissioner Gibbens offered the following resolution:

Resolved, That whenever it appears that an electric light company has a contract to light a street or public place for the City, entered into before the 1st of November, 1887, and there are in such street or public place poles or other supporting fixtures, and no subway for electric light conductors is prepared in said street or public place by the order of this Board, upon notice from said company to that effect, the Secretary of the Board is authorized to issue to said company permission to stretch wires or cables necessary to carry out said contract upon the said poles or other supporting fixtures already existing in said street, provided the said company can secure permission from the owners of the same to use them for this purpose subject to the rules and regulations of the Board.

Adopted; Commissioner Moss alone voting "no."

Commissioner Gibbens offered the following resolution:

Resolved, That whenever it appears that an electric light company has a contract to light a street or streets for the City signed before the 15th of October, 1887, and neither the said company nor any other electric light company has wires, poles or other fixtures in the said street or streets, the following is the part of the general plan of this Board for said locality and service:

Upon notice from said company and the filing with the Engineer of the Board of plans and maps of the localities showing places where said company is to place lampposts to carry out said contracts, and other connections desired, the Construction Company shall at once proceed to construct, under the supervision of the Engineer of the Board, a subway in accordance with the attached plan and specifications, and shall allow the said electric light company to place therein conductors having an insulation with a resistance of 600 megohms a mile under immersion during 48 hours, as the laying of said subway is progressing, making such provisions for connections therewith as shall be called for by the aforesaid and following plans.

Points at which said insulating wires or cables are joined must be insulated in the same manner as the remainder of the Windsor cables and by the manufacturers, whose certificate of test will be required for all wires or cables laid.

SPECIFICATIONS.

A box of yellow pine with an inside measurement of four inches by six, laid at an average of twelve inches below the surface of the street, in such part of the street as may be designated in permits of the Department of Public Works, substantially as described in accompanying plan and sketch.

Lost; Commissioners Gibbens and Moss voting "aye," and Mayor Hewitt and President Hess voting "no."

Mayor Hewitt offered the following resolution:

Resolved, That, to enable the electric lighting companies who have contracts with the City to execute their contracts, permission is hereby granted to erect such poles and string such wires as may be necessary for that purpose; provided the number, location and character of the poles shall first be approved by the Engineer of the Subway Commission, and the permit to be issued shall be approved by the Council to the Corporation.

Lost; Mayor Hewitt and President Hess voting for resolution, and Commissioners Gibbens and Moss against it.

Mayor Hewitt offered the following resolution of adjournment:

Resolved, That the Board adjourn, to meet to-morrow at 12 o'clock.

Unanimously adopted.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday October 21, 1887, at 12 o'clock m., being an adjournment of a meeting held October 20, 1887.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The following communication from Robert F. Sullivan was read, and, by unanimous consent, referred to the Engineer:

TROY, October 20, 1887.

HON. ARBAM S. HEWITT:

DEAR SIR:—I have on exhibition an iron conduit with 14 wires, which is calculated to carry the electric light for arc lights. Whenever the companies say that it cannot be done, you will please refer them to this method.

It can be found at the American Institute Fair, and I shall be there to answer questions next week after Tuesday noon. Yours with much respect,

ROBERT F. SULLIVAN.

The following communication from the Continental Conduit Company was read:

No. 115 Broadway,

NEW YORK, October 21, 1887.

HON. A. S. HEWITT, Mayor of New York City:

DEAR SIR:—The undersigned, in behalf of the Continental Conduit Company, presented to the Board of Electrical Control certain plans and specifications for underground conduits for electrical conductors. The said plans and specifications are

designated as the "Beese-Grant system," and were referred by the said Board of Electrical Control for investigation and report, as witness the minutes of said Board of Electrical Control, dated July 27, 1887.

In consideration of the apparent differences of opinion relative to the construction of conduits for different service, we would respectfully suggest that a Board of Electrical Experts and Engineers be appointed to adopt several of the best systems which have been submitted for consideration to your honorable Board, from which the Telegraph, Telephone and Electric Light Companies might select a construction which would best subserve the interests for underground service.

Very respectfully yours,

THE CONTINENTAL CONDUIT COMPANY,

JOHN D. BEESE, Secretary.

The following resolution was offered by Commissioner Gibbens:

Resolved, That the applications made to this Board by the Manhattan District Telegraph Company (numbered from 288 to 302, inclusive) for permission to place wires on poles already existing be granted.

Lost. Vote: Commissioners Hess and Gibbens, "aye"; Commissioner Moss, "no"; Mayor Hewitt declined to vote.

Resolution, by unanimous consent, reconsidered and adopted.

Vote: Mayor Hewitt, Commissioners Hess and Gibbens, "aye"; Commissioner Moss, "no."

Commissioner Gibbens offered the following resolutions concerning applications of the Western Union Telegraph Company:

Resolved, That the application of the Western Union Telegraph Company (No. 286) "to string four wires on present poles on Canal street, from Greenwich street to Varick street; two wires on Canal street, from Varick street to Church street; two wires on 41st street, from Ninth to Tenth avenue, for the purpose of connecting wires on the Elevated Railroad into offices of the Hudson River Railroad," be granted.

Adopted, all voting "aye," except Commissioner Moss, who declined to vote.

Resolved, That the application of the Western Union Telegraph Company "to string one cable on poles from Ninth avenue, through 65th street and the Stock Yards to the 62d street office and Elevator at 60th street, for the purpose of connecting with the cables now upon the Ninth Avenue Elevated structure," be referred to the Engineer, for him to investigate and report to the Board as to whether the desire is to put this cable on poles already erected or new poles; and, also, whether or not the application should be granted.

Unanimously adopted.

Resolved, That the application of the Western Union Telegraph Company (numbered 287) "to string one nineteen conductor cable on the Elevated Railroad structure, Sixth avenue route, from Dey street to Twenty-third street, for the purpose taking Baltimore and Ohio wires from poles," be granted, and that the Western Union Telegraph Company be requested by the Secretary to advise the Board as to the number of poles and wires which it will be possible to take down.

Unanimously adopted.

Resolved, That the application of the Western Union Telegraph Company "to string two (2) nineteen conductor cables on poles from No. 195 Broadway to the entrance of the Brooklyn Bridge, via Park Row, thence on the Elevated Railroad structure, via Second avenue route, to the Harlem River, for the purpose of taking wires from the Baltimore and Ohio poles," be referred back to the company, with direction to eliminate from the application that part of it embraced by the words, "195 Broadway to the entrance of the Brooklyn Bridge, via Park Row," because in that locality the cables can be placed in the subway already constructed, and the remainder of the application the Board will be ready to grant.

Unanimously adopted.

Resolved, That the application of the Western Union Telegraph Company "to run four 19-wire cables on existing poles in Broadway, from No. 195 Broadway to Exchange place and Broadway, for the purpose of bringing the Baltimore and Ohio wires into the Western Union Building," be returned to the company, with the information that a subway is being constructed along the route indicated in the application and will soon be ready for occupancy.

Unanimously adopted.

Resolved, That the application of the Western Union Telegraph Company "to run four 19 wire cables from 195 Broadway, through John street to Water street, for the purpose of bringing the B. & O. wires into the Western Union Building," be referred to the Engineer, with request to bring in specifications for a subway through that street which shall be sufficient to contain all the wires at present in that street, with a reasonable allowance for increase of business, in connection with the extension or addition to the Broadway route, for which a plan was brought before the Board October 20, 1887.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company relating to house connections and the putting of wires on existing poles, numbered from 138 to 285, inclusive, and 303 and 304, be granted.

Unanimously adopted.

The following application from the American Electric Manufacturing Company was read:

NEW YORK, October 20th, 1887.

To the Board of Electrical Control:

This company respectfully requests your Board to make some provision that will enable it to carry out its contract with the City for lighting Sixth avenue, Grand Boulevard and 110th street, subject to the rules and regulations of the Board.

Very respectfully,

THE AMERICAN ELECTRIC MFG CO.,

By N. R. O'CONNOR.

The application of the Harlem Lighting Company, dated October 20, 1887, for a permit "to erect electric light lampposts on Third avenue from Eighty-sixth street to 130th street," etc., printed in the minutes of the meeting of October 20, 1887, was read, and Mayor Hewitt thereupon offered the following resolution:

Resolved, That the application of the Harlem Lighting Company "to erect electric light lampposts on Third avenue from 86th street to 130th street, and on 125th street from First avenue to Fourth avenue," be granted, provided, however, that the style of posts to be used must be submitted to and approved by a committee composed of the Engineer and the President of the Board.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That wherever Electric Light Companies have contracts to light the City and submit to the committee constituted by the last resolution a map showing the location of the lampposts as approved by the Gas Commission, the President of the Board shall issue permits to such companies to erect lampposts sufficient to carry out their contracts.

Unanimously adopted.

The following resolution was offered by Commissioner Gibbens:

Resolved, That the application of Buehler & Bateman (numbered 137) for a permit to run four electric light wires, Edison incandescent system, from American Express Company stables, Forty-eighth street and Fourth avenue, to the offices of American Express Company, situated at the corner of Madison avenue and Forty-eighth street, one pole located at Fourth avenue and Forty-eighth street, be granted.

Unanimously adopted.

Mayor Hewitt offered the two following resolutions:

Resolved, That the Comptroller of the State be requested to furnish this Board with a statement showing the moneys received by him from assessment upon the telegraph and telephone companies of the City of New York for the payment of the expenses of this Board, the disposition which he has made thereof, and the unexpended balance, if any, now on hand; also, what steps, if any, said Comptroller has taken to enforce the collection of unpaid assessments; also, what steps, if any, said Comptroller has taken to levy assessments since October, 1886, to provide for the payment of salaries and expenses subsequently incurred.

Unanimously adopted.

Resolved, That it is the opinion of this Board that the monies raised by the Comptroller of the State of New York, under and in pursuance of the provisions of Chapter 499, Laws of 1885, as amended by Chapter 503, Laws of 1886, for the purpose of paying the salaries of the Commissioners and other necessary and incidental expenses, should be paid out by him quarterly for each consecutive quarter, without any priority or preference, and that said Comptroller be requested hereafter to follow this rule of payment.

Adopted. Vote: Mayor Hewitt, Commissioners Hess and Moss "aye;" Commissioner Gibbens "no."

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, December 22d, 1887, at 12 o'clock, noon.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

On motion the reading of the minutes of the last meeting was dispensed with.

The following communication from Park Benjamin was read:

PARK BENJAMIN, PH. D.,
EXPERT COUNSEL IN PATENT MATTERS,
SOLICITOR BEFORE THE U. S. PATENT OFFICE,
No. 32 PARK PLACE.
NEW YORK, November 1st, 1887.

THEO. MOSS, ESQ., Secretary Board of Electrical Control:

SIR:—In compliance with the request of the Board of Electrical Control contained in the resolution of the 4th of October, wherein certain "rules and regulations governing the occupancy of the subways of the Consolidated Telegraph and Electrical Subway Company" were referred to me, I have the honor to submit the enclosed rules for

the consideration of the Board. I have taken the liberty of embodying such suggestions and alterations as I am able to present in this form, as one more concise and definite than if made in the shape of annotations to the original rules; but, at the same time, I have not altered any substantial provision of the latter, except in so far as the Electrical questions involved rendered some modification apparently unavoidable.

I beg further to say that in reaching the conclusions here contained I have been greatly favored by the impartial counsel of Mr. Edward Weston, until recently the superintending electrician of one of the largest Electric Lighting Corporations. Mr. Weston's experience in the matters here involved has been of the most extensive and practical character, and upon the results of his experiments, most kindly and fully placed at my disposal, I base such provisions as may appear arbitrarily fixed.

I am, Sir, very respectfully yours,

PARK BENJAMIN.

Rules and Regulations Governing the Occupancy of the Subways of the Consolidated Telegraph and Electrical Subway Company:

1. All applications for space in the subways shall be made in writing and shall give:

- (a) The name of the applicant.
- (b) The term for which the use of the conduit or conduits is wanted.
- (c) The number, material and dimensions of conductors proposed.
- (d) The arrangement of said conductors, whether singly or in cables, and if in cables the number of conductors and their disposition in each cable.
- (e) The maximum electro-motive of the machine or machines supplying the current to be used.
- (f) The nature of the insulating material or materials to be employed.
- (g) Such other specific information as will fully explain the use to be made of the space desired.

2. All applications for permits to make repairs or alterations in conductors in the subways shall be made in writing, and shall give:

- (a) The name of the applicant.
- (b) A complete identification of the conductor or conductors referred to and of the particular conduit or conduits to which access is desired.
- (c) Specific information as to the extent and character of the proposed repairs or alterations, and of the probable date when the same will be completed and the conductor or conductors restored to condition for use.
- (d) The insulation resistance of the conductor or conductors as shown by the latest test, and the date of said test.

3. Whenever in the judgment of the Subway Company, repairs or alterations in a conductor are necessary or desirable, said repairs or alterations shall be made by the party owning or controlling said conductor immediately upon notice. During the

progress of any repairs or alterations upon or in a conductor the party owning the same shall take all precautions which the Subway Company may judge expedient to protect the conductors of other parties from injury or other deterioration.

4. All conductors drawn into and operated in the conduits, and intended to convey currents of an electro-motive force exceeding fifty (50) volts, shall have an initial insulation resistance of not less than fifteen meg-ohms, per mile, per one hundred volts electro-motive force of current in the circuit. Whenever the insulation resistance of a conductor as aforesaid shall prove to be less than five (5) meg-ohms, per mile, per one hundred volts, the use of that conductor shall at once cease, unless the actual electro-motive force in its circuit be reduced so as to re-establish the foregoing ratio.

5. The insulation resistance per mile length of all branches and feeders of the main conductors shall at least equal that of the respective conductors to which said branches and feeders are connected.

6. The insulation resistance of each length of cable or conductor shall be determined before said length is laid in the subway. In making this determination an electro-motive force of current of not less than one hundred and fifty volts shall be employed, and the minimum initial resistance as provided in Rule 4 shall not be diminished through and after an immersion of the conductor under test of at least sixty consecutive hours. All lines shall be tested for insulation resistance immediately after completion in the subway, and daily thereafter for a period of one month, and thereafter at least weekly. A conductor shall be tested for insulation immediately after any new connection with, addition or repair to, or alteration of any sort, in said conductor is made, and also whenever any other conductor is placed in the same tube; conductors conveying currents of less than fifty (50) volts electro-motive force are excepted from this rule.

7. All tests and determinations called for by these rules shall be made by parties owning or controlling conductors. Duly authenticated records of the results of such tests and determinations within 24 hours after the completion of the same, shall be filed with the Subway Company, which shall have power to verify or repeat such tests or determinations in its discretion.

8. All conductors shall be placed in the subways by the lessees under the immediate supervision of a representative of the Subway Company. No person shall have access to the subways nor to any manhole, nor shall work of any description be done in said subways or manholes unless under the immediate personal supervision of such representative. The Subway Company shall have authority to require such alterations in conductors as it may deem necessary for their safety or the safety of the subway or adjacent conductors; and also to cause the current in any conductor to be interrupted or reduced for such period of time as may be requisite in the judgment of said company for the proper protection or necessary convenience of persons working in the manholes or upon the subways in the vicinity of said conductor.

9. All alterations of or additions to the subways for the purpose of connecting conductors therein with points outside will be made by the Subway Company upon the request of the lessee desiring the same, provided the same have been authorized by the Board of Electrical Control, and the expense of making such additions or alterations is satisfactorily guaranteed by the parties desiring them.

10. Rental to be paid yearly in advance. Applicants will be required to enter into a written contract with satisfactory guarantees for its performance.

11. In no case will the Subway Company be responsible for any damage whatever to persons or property due to the existence or employment of the subways or the conductors therein or any apparatus connected therewith. The Subway Company will, however, use every reasonable precaution to prevent damage from any cause within its control.

12. The Subway Company reserves to itself the right to add to or amend these Rules from time to time as may in its judgment be necessary, subject to the approval of the Board of Electrical Control.

The following resolution was thereupon offered by Commissioner Gibbens:

Resolved, That the rules and regulations submitted to the Board by the Consolidated Telegraph and Electrical Subway Company be approved as far as they go, and that the additions suggested by Park Benjamin be referred to the company, so that such of them as may seem desirable may be embodied in the rules and regulations, and referred back to this Board for its approval.

Adopted, Mayor Hewitt declining to vote, all others voting "aye."

The following opinion from the Corporation Counsel was read and ordered spread on the minutes:

LAW DEPARTMENT,
OFFICE OF THE COUNSEL TO THE CORPORATION

NEW YORK, November 4th, 1887.

To the Honorable the Board of Electrical Control:

GENTLEMEN:—Pursuant to an oral request submitted by Commissioner Gibbens in behalf of your Board, I beg leave to transmit the following memorandum in relation to your powers.

The provision of the Revised Statutes is as follows:

"Whenever any power, authority or duty is confided by law to three persons, and whenever three or more persons or officers are authorized or required by law to perform any act, such act may be done and such power, authority or duty may be exercised and performed by a majority of such persons or officers upon a meeting of all the persons or officers so intrusted or empowered, unless special provision is otherwise made, and whenever a duty has been or shall be enjoined by law upon three or more persons or officers, and one or more of them shall have died, or have become mentally incapacitated to act, or shall refuse or neglect to attend a meeting of such persons upon reasonable personal notice thereof, then the action of a majority of the whole number appointed shall be binding and effective for all the purposes for which they were appointed, unless special provision is otherwise made in the existing laws."

The questions propounded in relation to the action of the Subway Commissioners are as follows:

First: All the members of the Commission being present, three only voting, one declining to vote, how many votes are necessary in order to pass a resolution?

In this case all the members of the Commission are present, consulting, and it requires the votes of a majority of the whole to accomplish the valid adoption of a resolution.

The member of the Board who declines to vote is, however, present, and the decision of the Board can be declared only by the votes of a majority of the members present.

Second: In the case of the refusal or neglect of a member of the Commission to attend a meeting upon reasonable personal notice thereof, how many votes are necessary in order to pass a resolution?

Under the statute above quoted a majority of the whole number of the Commissioners constitutes a quorum sufficient to act upon all matters within the jurisdiction of the Commission, and a vote of a majority of the quorum is sufficient. In *ex parte Wilcox*, 7 Cow. 409, it is said:

"The general rule also is that to make a quorum of a selected and definite body of men possessing the power to elect, a majority at least must be present, and then a majority of the quorum may decide."

In *Coles agst Trustees of Williamsburgh*, 10 Wend., 664, it is said, in relation to the action of a body of five Commissioners:

"The act requires three out of five, or a majority, to make a quorum. If there were but three persons, then the vote of two, being a majority, would be valid."

In *Kyd on Corporations*, Vol. 1, p. 401, Lord Hardwick is thus quoted:

"It cannot be disputed that wherever a certain number are incorporated a major part of them may do any corporate act; so, if all be summoned and a part appear, a major part of those that appear may do a corporate act, though nothing be mentioned in the charter of the major part."

In *Sergeant agst Webster*, 13 Metcalf, 504, by Chief Justice Shaw, it is said:

"In ordinary cases when there is no other express provision, the majority of the whole number of an aggregate body who may act together, constitute a quorum, and a majority of those persons may decide any question upon which they can act."

Vide also *People vs. Walker*, 2 Abt. Pr. Rep., p. 44.

I remain, yours respectfully,

MORGAN J. O'BRIEN, Counsel of the Corporation.

Communications, as follows, from Gen. Newton, C. R. Hall, Deputy Collector; W. W. Rider, General Manager of Mutual District Messenger Company, were read and ordered spread on the minutes:

DEPARTMENT OF PUBLIC WORKS,
Commissioner's Office, No. 31 Chambers Street

NEW YORK, October 26, 1887.

HON. JACOB HESS, Commissioner Board of Electrical Control:

SIR:—In reply to yours of September 30th last, in which you reduce the alleged number of 19 inspectors to 16, I will go further and state that my chief inspector reduces the number to 14. You are probably aware that the inspectors were appointed

after notice sent to the Chief Inspector by the various officials, sometimes connected with the Board of Electrical Control; at others, with the Construction Companies; and the matter of their appointments, as it appears by the records, was arranged between the Chief Inspector, Mr. Haskins, and the officials referred to above. I find from Mr. Haskins' letters to me that Mr. Vail, Chief Engineer of the Edison Electric Illuminating Company, issued printed orders to his subordinates to pay no attention to the orders of any of the City inspectors. Mr. Haskins also states that in several instances he allowed one inspector to cover the work on two or three streets until he found that it was impossible to hold the work within the limits, as some of the Engineers on the work would, when the inspector was on some of the other openings, order the work extended, in violation of the rules of this department, and again, although one inspector might take a more extended field when the question was one merely of excavation, still it is quite plain that when the trenches were to be filled it would then be necessary that the inspector should be on hand at each place where this filling was going on. The arrangement was made between Mr. Haskins, the Chief Inspector, and the other persons referred to, based on what was gone before, and the result was the appointment of the number which you complain of as being excessive, and which I trust you will perceive by this explanation to have been necessary. I am also informed that gentlemen connected with the Construction Company and with your Board stated to the Chief Inspector that they would rather pay two or three men awaiting new street openings than to be delayed when the Construction Company was ready to begin a new street.

Respectfully yours,

JOHN NEWTON, Commissioner of Public Works.

STATE OF NEW YORK,

COMPTROLLER'S OFFICE.

ALBANY, November 28th, 1887.

THEODORE MOSS, ESQ., Secretary Board of Electrical Control, 1218 Broadway, N. Y.:

DEAR SIR:—Enclosed are receipts in blank for \$1,800 and \$1,025, to be signed by F. A. Lovecraft and Wm. J. Sefton respectively, the amounts named being for their services as Assistant Secretary and as Stenographer for the Commissioners of Electrical Subways up to 8th of July, 1886. Please have them signed, certify to them and return them to this office.

In reply to your inquiry as to the funds, we would say that there is now on hand \$4,144.86, of which we propose to John Thomson on account of his claim \$1,300, if, upon examination, it shall be found correct.

The payments to Messrs. Lovecraft, Sefton and Thomson will settle the claims against the Commission up to July 8th, 1886, as far as possible, and the remaining claims will be adjusted as fast as funds are received.

We have not yet received returns from all the warrants delivered to the Sheriff.

Yours respectfully,

C. R. HALL, Deputy Comptroller.

[DECEMBER 22, 1887.]

THE MUTUAL DISTRICT MESSENGER COMPANY (Limited),
EXECUTIVE OFFICES, 29 MURRAY STREET,

NEW YORK, November 18, 1887.

MR. THEO. MOSS, Secretary Board of Electrical Control, 1218 Broadway:

DEAR SIR:— We beg to acknowledge your favor of the 5th ult., enclosing a copy of a resolution passed by your Board on the 4th ult., relating to telegraph and telephone service along Broadway, between Cortlandt street and Vesey street, thence along Park Row to the Brooklyn Bridge, and in the vicinity thereof.

In connection therewith I would say that we have no poles on any of the streets of the city of New York.

Our wires are all "house top wires," and to supply the wants of the people residing in several city blocks only one wire is required for the whole number of connections on those blocks.

Our system is to locate an office, say every ten blocks, north and south through the heart of the city, and then radiate wires from the office so located north and south, say five blocks, and east and west three blocks.

For example, we have an office between Twenty-second and Twenty-third streets on Broadway. We start one wire on the housetops down to Fourth avenue, on the block between East Twenty-second and Twenty-third street, tapping said wire where our messenger boxes are desired at residences and stores, and that one wire may accommodate the wants of all the people residing north of Twentieth street to Twenty-third street, and from Lexington Avenue to Broadway, before the end reaches the branch office.

Any plan that your Board may adopt that will afford us facilities for making connections of this character will meet our hearty co-operation.

An underground system that does not include such facilities could not be utilized by us.

Hoping to hear from you at an early date, I beg to remain,

Yours very truly,

W. W. RIDER, General Manager.

The following correspondence between representatives of the Western Union Telegraph Company and President Jacob Hess was read and ordered spread on the minutes:

November 17, 1887.

NORVIN GREEN, ESQ., President Western Union Telegraph Company:

DEAR SIR:—The Secretary of the Board of Electrical Control has been directed, by resolution of the Board, to communicate with you, with a view to ascertain how far the obligation incurred by your company many months since to remove the poles and wires in Third and Ninth avenues, along the line of the elevated railroad structure, has been fulfilled. We have received from you two communications, showing the partial fulfillment of that obligation.

As I am informed by one of my colleagues that this matter will be brought up at the next meeting of the Board, I beg to request definite information as to the time when this work of removal will be fully completed.

Very respectfully,

JACOB HESS, President, etc.

EXECUTIVE OFFICE,

WESTERN UNION TELEGRAPH COMPANY.

NEW YORK, November 29th, 1887.

HON. JACOB HESS, President Board of Electrical Control, 1218 Broadway, New York:

DEAR SIR:—I have your letter of the 17th inst., addressed to Dr. Green, President of this Company, asking for definite information as to the time when the removal of the poles and wires of this Company in Third and Ninth avenues, along the line of the Elevated R. R. structures, will be fully completed.

In reply thereto, I beg to say that the letter written by Sup. W. C. Humstone to Mr. Theodore Moss, Secretary of your Board, on November 17th, explained in detail what poles and wires we had been able to take down, and pointed out the fact that we are prevented from taking down the poles in Tenth and Eleventh avenues between Fifteenth and Fifty-fifth streets, and on Third avenue between Fifth and One Hundred and Thirtieth streets, by the occupancy of the wires of other companies, notably the Police and Fire Alarm wires.

This letter having been written on the same day that you wrote your letter to Dr. Green may have crossed that letter in delivery, and I have no doubt furnishes you with all the information you desire. I therefore deem it only necessary for me to confirm the statements of Superintendent Humstone made therein.

Yours truly,

THOS. T. ECKERT, V. P. and General Manager.

[The following is the letter referred to in this last communication:]

WESTERN UNION TELEGRAPH COMPANY,

SUPERINTENDENT'S OFFICE. 195 BROADWAY.

NEW YORK, November 17, 1887.

THEODORE MOSS, Secretary Board of Electrical Control, 1218 Broadway, N. Y.:

DEAR SIR:—Replying to your favor of the 11th inst., I beg to call your attention to the letter of President Green of July 29th, which gave the number of poles and amounts of wire taken down to and including that time.

Since that date we have taken down 17 poles on the east side of Third avenue, between Forty-sixth and Fifty-fifth streets, and fifteen poles on Fifty-fifth street, between Second avenue and the East River. We have also taken down 10 wires on the poles known as the Bankers' and Brokers' line, beginning at Fifty-fifth street to Eleventh avenue, Thirty-seventh street, Tenth avenue, Sixteenth street, Hudson, Christopher,

Bedford, West Houston, Varick, Vestry and Hudson to Chambers streets, and are ready to take down the poles in Tenth and Eleventh avenues, between Fifteenth and Fifty-fifth streets, and on Third avenue, between Fifth and One Hundred and Thirtieth streets, as soon as the wires of other companies, noticeably the Police and Fire Alarm, can be removed therefrom.

Very respectfully,

W. C. HUMSTONE, Superintendent.

EXECUTIVE OFFICE,

WESTERN UNION TELEGRAPH COMPANY,

NEW YORK, December 17th, 1887.

HON. JACOB HESS, President Board of Electrical Control, 1218 Broadway, N. Y.:

DEAR SIR:—In reply to your favor of the 3rd inst., I am now advised that the wires belonging to companies other than the Western Union Telegraph Company on the poles on Third avenue, between Fifth and One Hundred and Thirtieth streets, are as follows:

Gold and Stock Telegraph Co., an average of	2 wires
American District Telegraph Co., an average of	2 wires
Telephone Company, an average of	4 wires
Fire Department, an average of	10 wires
Police Department, an average of	2 wires

We have requested the American District Co., the Telephone Co., and the Gold and Stock Co. to remove their wires from these poles, and are taking steps to remove the Western Union wires as rapidly as possible, thus leaving only the wires of the Fire and Police Departments on the poles—the presence of which wires, as I have already stated, will, of course, prevent the removal of the poles until some other provision is made for them by the departments.

Yours very truly,

THOS. T. ECKERT, V. P. and General Manager.

The following communication from H. S. Huidekoper, Vice President, etc., of Metropolitan Telephone and Telegraph Company, was read and ordered spread on the minutes:

OFFICE OF THE VICE PRESIDENT AND GENERAL MANAGER

OF THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.,

18 CORTLANDT STREET, NEW YORK, Oct. 22d, 1887.

Board of Electrical Control, 1218 Broadway, New York:

GENTLEMEN:—Referring to the request made by you that the poles and wires on part of Broadway, owned by this company, should be removed, I beg now to inform

you that this company has no poles or wires on the line of Broadway from 14th to 42nd street, having removed, during the last thirty days, such as it had there.

Yours respectfully,

H. S. HUIDEKOPER, Vice President and Gen. Manager.

The Board ordered the following communication from J. Elliot Smith, Superintendent, etc., spread on the minutes:

HEADQUARTERS, FIRE DEPARTMENT OF THE CITY OF NEW YORK,

OFFICE OF SUPERINTENDENT OF TELEGRAPH,

157 AND 159 EAST 67TH STREET,

NEW YORK, October 28th, 1887.

HON. JACOB HESS, President Board of Electrical Control, New York City:

DEAR SIR:—On 6th avenue between Carmine and 58th streets this Department has wires over the entire distance.

Its own poles, however, are not continuous, but put in at intervals, and where they do not exist, the poles of the Metropolitan Telephone Co. are used. We are advised that the Metropolitan poles are to be removed, which will necessitate the protection of the fire wires.

As the department is without the necessary funds to place them within the conduit, can not some arrangement be made for the continuance of the poles necessary to give us a continuous line, without our being required to put up new poles for the purpose? Should be pleased to hear from you on the subject.

Very truly yours,

J. ELLIOT SMITH, Superintendent.

The Board also ordered the following communications between J. Elliot Smith and President Hess and the letter of Secretary Moss to Edward Lauterbach, President Consolidated Telegraph and Electrical Subway Co., spread on the minutes:

HEADQUARTERS, FIRE DEPARTMENT,

OFFICE SUPERINTENDENT OF TELEGRAPH,

157 AND 159 EAST 67TH STREET.

NEW YORK, November 28th, 1887.

To the Hon. Board of Electrical Control, New York City:

GENTLEMEN:—In order that the underground telegraph system of this department may be extended through and by means of the conduits which have been provided by your Commission, and to effect necessary connections with the various signal stations upon and contiguous to the routes thereof, it will be necessary to provide means for getting from the manholes to the outlet points upon the sidewalk.

I enclose memorandum of such outlets as will be necessary.

In some instances there may be modifications, as to precise corner, etc., to accommodate any objections which may arise.

These outlet branches may be in a general single pipe not larger than one and a half inches.

Very respectfully,

J. ELLIOT SMITH, Superintendent.

N. W. corner of Whitehall and State streets.
S. E. corner of Whitehall and Stone streets.
S. E. corner of Battery Place and Broadway.
N. W. corner of Morris street and Broadway.
N. W. corner of Rector street and Broadway.
N. W. corner of Cedar street and Broadway.
N. E. corner of Maiden Lane and Broadway.
S. W. corner of Church and Cedar streets.
S. W. corner of Church and Fulton streets.
N. W. corner of Church and Barclay streets.
S. E. corner of Murray street and College Place.
N. E. corner of West Broadway and Chambers street.
S. E. corner of West Broadway and Worth street.
N. W. corner of West Broadway and North Moore street.
N. W. corner of West Broadway and Canal street.
S. W. corner of South Fifth avenue and Broome street.
S. W. corner of South Fifth avenue and Spring street.
S. W. corner of South Fifth avenue and Prince street.
S. E. corner of South Fifth avenue and Houston street to Mercer street.
S. W. corner of South Fifth avenue and Bleecker street.
S. E. corner of South Fifth avenue and Fourth street.
S. E. corner of 6th avenue and Fourth street.
N. E. corner of 6th avenue and Washington Place.
N. W. corner of 6th avenue and Waverly Place.
N. W. corner of 6th avenue and 10th street.
N. W. corner of 6th avenue and 11th street.
N. W. corner of 6th avenue and 14th street.
N. W. corner of 6th avenue and 17th street.
N. W. corner of 6th avenue and 20th street.
S. E. corner of Broadway and 58th street.
S. E. corner of Broadway and 53d street.
N. E. corner of Broadway and 48th street.
S. E. corner of Broadway and 47th street.
N. W. corner of Broadway and 44th street.
N. W. corner of Broadway and 42d street.
N. W. corner of Broadway and 38th street.
S. W. corner of Broadway and 34th street.
N. E. corner of Broadway and 31st street.
S. W. corner of Broadway and 28th street.
S. W. corner of Broadway and 25th street.
S. W. corner of Broadway and 23d street.
S. E. corner of Broadway and 20th street.
N. E. corner of Broadway and 17th street.

N. E. corner of Broadway and 15th street.
58th street, S. W. corner of 7th avenue.
58th street, N. E. corner of 5th avenue.
58th street, N. E. corner of Park avenue.
58th street, N. W. corner of Lexington avenue.
18th street opposite Engine House between 5th avenue and Broadway (2½ inch duct.)
Lexington avenue, East side, from 66th to 58th streets, four (4) 2½ inch ducts.

December 3, 1887.

J. ELLIOT SMITH, Esq., Superintendent, Headquarters of the Fire Department, 157 and 159 East Sixty-seventh St., City:

DEAR SIR:—I beg to acknowledge the receipt of your letter addressed to the Board of Electrical Control, which will be brought before the Board at its next meeting.

The Board will undoubtedly take action to provide the connection which you desire, but I would be glad to learn from you, for the information of the Board, whether there is any immediate prospect of your Department making use of these connections when they are provided; and, if not, when such will probably be the case.

Very respectfully,

JACOB HESS, President.

HEADQUARTERS FIRE DEPARTMENT, OFFICE SUPERINTENDENT
OF TELEGRAPH, 157 AND 159 EAST 67TH STREET.

NEW YORK, December 13th, 1887.

HON. JACOB HESS, President Board of Electrical Control, N. Y. City:

DEAR SIR:—Replying to your favor of the 3d instant, I beg to inform you that negotiations are now in progress for the procuring of a limited number of wires in cables to be placed in the conduits now prepared.

If successful, we shall make use of the Lexington avenue connection and many of the others, especially those north of Prince street contained in my list.

I feel quite confident we shall be able to procure the cable, but will say if we do not succeed in getting it, you can have the benefit of probably ten days notice, before we can commence work.

Very respectfully,

J. ELLIOT SMITH, Superintendent.

EDWARD LAUTERBACH, Esq., Pres. Consolidated Tel. & E. Subway Co., 120 Broadway, City:

DEAR SIR:—I enclose two communications from the Fire Department, showing connections desired.

As it is a part of your contract to furnish underground facilities for the Fire and Police Departments, I would suggest that you communicate, on behalf of your company, with Mr. Smith, and make such connections as he may desire, under the resolution of the Board authorizing you to make additions to the underground subways where desired for making connections.

Very respectfully,

THEODORE MOSS, Secretary.

The following communications from H. S. Huidekoper, Vice President Metropolitan Tel. & Tel. Co., were ordered spread on the minutes:

OFFICE OF THE VICE-PRESIDENT AND GENERAL MANAGER
OF THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.
18 CORTLANDT STREET.

NEW YORK, November 22nd, 1887.

Board of Electrical Control, 1218 Broadway, New York:

GENTLEMEN:—Acknowledging receipt of your of November 18th. addressed to the President of this Company, notifying us that the period allowed by law for the removal of certain poles and wires belonging to this company had almost or quite expired, I beg to say that on October 22d we advised you by letter that this Company did not then have any poles or wires on Broadway between 14th and 42nd streets, which is one of the sections referred to in your letter of the 18th.

As regards the wires and poles on Sixth avenue, from 22nd to 58th streets, I have to say that this Company has now no poles or wires on Sixth avenue between 22nd and 32nd streets, that it will doubtless by December 1st have removed all its wires and poles on Sixth avenue between 32nd and 39th streets, that possibly December 1st and probably by December 10th it will have removed all its wires and poles on Sixth avenue between 39th and 58th streets.

As regards Broadway and Park Row from Cortlandt street to the Brooklyn Bridge, I would say that this company has now no poles from Dey street to the Brooklyn Bridge, and that the poles between Dey street and Cortlandt street will be removed as soon as the necessary cables can be procured and made available for use.

As regards the cross streets between Fifth and Sixth avenues, between 14th and 34th streets, I beg to say that this company has not been advised that conduits have been constructed in these cross streets so as to enable us to remove the pole lines and wires.

As regards 58th street, from Third avenue to Eighth avenue, I beg to report that cables which we shipped ten days ago from Chicago, will be drawn into the 58th street conduits at an early day, so as to permit of the removal of such poles and wires as belong to this company, and that the removal of the poles we own on 58th street will be a matter which will have our best attention, as we are anxious to get our wires on that street underground at the earliest moment possible. Trusting that this report will be satisfactory, I am,

Yours respectfully,

H. S. HUIDEKOPER, Vice President and General Manager.

OFFICE OF THE VICE PRESIDENT AND GENERAL MANAGER OF THE
METROPOLITAN TELEPHONE AND TELEGRAPH CO., 18 CORTLANDT ST.

NEW YORK, December 21st, 1887.

Board of Electrical Control, 1218 Broadway, New York:

GENTLEMEN:—Referring to your favor of Nov. 18th and my respects of Nov. 22nd in partial answer thereto, I beg to say that we now find that the first pole on east side of Sixth avenue, north of 21st street, has cables on it which we cannot at the present time remove, and we beg that you will allow said poles to remain standing for a time, at least until you cause the removal of poles on Sixth avenue north of 21st street.

In further reference to my letter of November 22nd, I beg to confirm the statement made therein, that we were not using any poles or wires on Sixth avenue between the north side of 21st street and the south side of 32nd street, excepting, however, the one pole near 21st street, referred to above. I would further state that we confidently expect by December 31st to have no further necessity for any wires above ground or any poles on Sixth avenue between 32nd and 58th streets, and that the delay in removing our wires on such part of Sixth avenue has been occasioned by circumstances beyond our control and through no fault of ours. Asking your indulgence in the matter, I am,

Very respectfully,

H. S. HUIDEKOPER, Vice President.

The following communication from J. C. Allen, Secretary of Brush Electric Illuminating Company, was ordered spread on the minutes:

THE BRUSH ELECTRIC ILLUMINATING CO.,

204-210 ELIZABETH STREET.

NEW YORK, November 23rd, 1887.

JACOB HESS, ESQ., President Board of Electrical Control:

DEAR SIR:—Replying to your favor of the 18th, we can say, that we have contracted for a cable to be placed in the conduits on Broadway from Fourteenth to Thirty-fourth streets.

This cable is now in process of construction, and we expect in a few days to have it ready to be drawn in. We have taken no action as yet in regard to the moving of the poles from the streets where the conduits are already laid, but are waiting to test this cable first.

It is the intention of this company, that if this cable proves satisfactory, to place our wires in the conduits on the various streets where they are now ready, as soon as we are satisfied of the successful operation of the cable we are about to lay down.

You can readily see that we are as anxious to get our wires under ground as you are to have us, and we trust you will give us as much time as possible to test the life and insulating properties of our underground wires before we remove any of the aerial wires now in use.

Yours truly,

BRUSH ELECTRIC ILLUMINATING CO.,

By J. C. ALLEN, Secretary.

The following communications between Eugene T. Lynch, President of U. S. Illuminating Co., and President Hess were ordered to be spread on the minutes:

THE UNITED STATES ILLUMINATING CO.,

59 AND 61 LIBERTY STREET,

NEW YORK, November 25th, 1887.

JACOB HESS, Esq., President Board of Electrical Control:

DEAR SIR:—We beg to acknowledge the receipt of your favor of November 18th.

The notice from your Board to which it refers was communicated to us by letter of September 21st ult., from Mr. Theodore Moss, Secretary, etc. In reply to this notice, we sent to the Board, under date of October 3rd ult., a map showing the points of distribution, and the electrical connections necessary in localities mentioned in the notice, to enable this Company to transact its business with its present customers.

In the same communication we suggested that your Board should direct the Consolidated Telegraph and Electrical Subway Company to make subsidiary connections in portions of the streets designated in the notice, and to test the efficiency of the underground system for a sufficient length of time to establish the fact that it is a safe substitute for the overhead system, and will not impair the efficiency of the latter.

At the same time we requested information as to the expense of the subsidiary connections and the rental per lineal foot of subway and subsidiary connections.

To that communication we have received no reply from your Board. Later in October we received, as we were informed, at the suggestion of Mr. Lauterbach, President of the Consolidated Telegraph and Electrical Subway Company, a copy of a letter of date October 15, 1887, addressed to Mr. Lauterbach by Mr. Leonard F. Beckwith, Chief Engineer, as we are informed, of the Company last mentioned. We also received a copy of the rules and regulations of the Consolidated Telegraph and Electrical Subway Company.

Our poles have not been removed, and are not now being removed from the streets designated in your notice. An examination of the letters and documents above referred to will indicate the reason.

To remove our wires from the poles and place them in the conduits now provided, before the latter have been tested, and before any provision has been made for the distribution of the electrical currents from the conduits to customers, would endanger not only that part of our lines passing through the localities mentioned, but all lines connected therewith—in fact, our entire system.

If the service should fail in the localities mentioned, the failure in other localities, with loss of customers and damage to property, would necessarily follow. It would, in fact, be impracticable for the Company to transact its business, or maintain or operate its system.

Moreover, we have not been informed by your Board of the cost of rental in the underground conduits. Mr. Beckwith's estimate of the cost of subsidiary connections, and such information as we have obtained relating to rental, would indicate that the expenses will be so great as in fact to prohibit business with our present customers, or most of them.

We therefore again respectfully request that the conduits intended for electric lighting companies be tested in limited sections, with reference to their efficiency and also with reference to the methods of distribution, and that the time limited by your notice be extended until the tests show that the conduits will serve the purposes defined by the Acts of the Legislature.

We will cheerfully do whatever is reasonable, within our power, in making the necessary tests.

Very respectfully yours,

EUGENE T. LYNCH, President.

EUGENE T. LYNCH, ESQ.,

PRESIDENT UNITED STATES ILLUMINATING CO.,

59 & 61 LIBERTY ST., CITY.

DECEMBER 3, 1887.

DEAR SIR:—Permit me to acknowledge the receipt of your letter of the 25th ultimo.

In reply I would say that, while I am not able to speak for my colleagues, and cannot say what the action of the Board will be upon your letter, which will be presented to it at the next meeting, I beg to call your attention to the Act constituting the Board of Electrical Control, Chapter 716 of the Laws of 1887, sec. 3:

"Whenever, in the opinion of the Board, hereinbefore constituted, in any street or locality of said city a sufficient construction of conduits or subways under ground shall be made ready under the provisions of this act, reference being had to the general direction and vicinity of the electrical conductors then in use overhead, the said Board shall notify the owners or operators of the electrical conductors above ground in such street or locality to make such electrical connections in said street or through other streets, localities or parts of the city with such underground conduits or subways so specified as shall be determined by the said board, and to remove poles, wires or other electrical conductors above ground, and their supporting fixtures or other devices from said street and locality within ninety days after notice to such effect shall be given. This provision is made a police regulation in and for the city of New York."

Speaking for myself, I am unable to see how this language can be held to entitle your company to a test of the subways constructed, provided that, in the opinion of the Board, they are adequate for your use and, in regard to the notice which you received from this Board to the effect that such underground accommodations are prepared for your use in certain streets some seventy-five days since, I may say that that communication has been approved by the Corporation Counsel of the city, who is the legal adviser of the Board, as a sufficient notice of the complying with the terms of the act above quoted.

Still speaking for myself, I would say that while, as a member of the Commission, I should be opposed to exercising any harsh measures against companies which in good faith propose to obey the law, even although they are unable to meet its requirements fully within the ninety days which it allows, it appears to me that it will be the duty of the Board to exert its authority to the utmost in cases where companies will not and do not attempt to comply with its terms.

Your communication will be read before the Board of Electrical Control at its next meeting, as well as any further communication which you may see fit to make in reply to this letter. I have the honor to be,

Very respectfully,

JACOB HESS, President.

THE UNITED STATES ILLUMINATING CO.,

59 AND 61 LIBERTY ST.,

NEW YORK, December 6, 1887.

JACOB HESS, ESQ., President Board of Electrical Control, 1218 Broadway, N. Y.:

DEAR SIR:—Your letter of the 3rd inst. was duly received. Its disavowal of any intention to exercise "any harsh measures against companies which in good faith prepare to obey the law," is assuring, but we must deprecate the implied discrimination between this and other companies.

No companies are more desirous than our own to obey the law in good faith; but neither this Company, nor any other, can with proper regard to the rights of its stockholders and its duty to protect their interests, hazard its entire business and property by abandoning its present working system before it has assurance of an efficient substitute. So far as we are informed, no electric lighting company has yet operated any wires in the conduits of the Consolidated Telegraph and Electrical Subway Company. Indeed, we understand that the only wires that have been placed in the conduits are those of the Metropolitan Telephone Company, and that that Company has drawn in only some wires of its trunk lines and none for direct service or distribution to its customers.

We have endeavored, in our correspondence, to show to your Board that an immediate transition from the overhead system to the conduits recently laid, would endanger our business not only in the localities traversed by the conduits, but throughout all connecting circuits, and that it might so affect our circuits and stations as practically to destroy our business and permanently injure our property.

This subject is difficult to treat in correspondence, and, if it has not already been made clear, we would respectfully ask a hearing before your Board. In former letters we have suggested that a test of the conduits and of methods for distributing the electric current to customers, should be made by the Subway Company.

Understanding from your letter that your Board does not favor that suggestion, we now respectfully request that you will give our Company permission to make subsidiary connections and tests in such locality where the conduits are laid, as you may think best. As the subsidiary connections will involve displacements of curbs and walks, we suggest that such localities should be designated as will cause the least inconvenience to the public at large, as well as to our customers. We shall be glad to communicate with your Engineer, or any one your Board may designate, with reference to this subject.

We also beg to call your attention to the fact that our inquiries as to the amount of rental to be charged for the use of the subway remain unanswered.

We formerly understood that the rental for subways was not to exceed the cost of maintaining overhead wires.

The information we have recently obtained on this subject, while indirect and quite indefinite, indicates that the rental will greatly exceed the cost of such maintenance and indeed, that the expense of the underground systems will be such as to exceed in many localities our total receipts from customers, and practically to prohibit our business.

We respectfully request such exact information on this subject, as your Board may be able and willing to supply.

Referring to the extracts from the acts of 1887, contained in your letter, we beg to say that we do not desire to enter upon the discussion of the law in a spirit that may appear to yourself or to the Board, indecorous or obtrusive.

At the same time it seems proper to suggest that the extracts give prominence to your powers but not to your duties.

We are informed that the Act of 1887 imposes upon your Board all the duties imposed by the Act of 1885 upon the Commissioners appointed thereunder, in respect to the maintenance of electrical conductors.

We are also informed that the Act of 1885 imposed upon said Commissioners the duty of affecting the change from the overhead to the underground system in such manner that the owners of electrical conductors could maintain and operate their conductors underground and transact their business with underground conductors. We are also informed that the Act of 1885 imposed on said Commissioners the duty of converting overhead systems, without impairing the efficiency of their service, and in a manner consistent with the convenient use by the public.

In view of these provisions, it seems to us reasonable to suggest that the change should be gradual and not violent, and should be made only when efficient tests should have shown that the change would conform to the policy and purpose of the law.

Trusting that our requests may meet with a favorable response, we remain,

Very respectfully,

EUGENE T. LYNCH, President.

EUGENE T. LYNCH, ESQ.,

PRESIDENT U. S. ILLUMINATING CO..

59 and 61 Liberty Street, City.

DECEMBER 21, 1887.

DEAR SIR:—Your letter of the 6th inst. has been received, and I shall take pleasure in laying it before the Board of Electrical Control at its next meeting.

As one of the members of the Board I am unable to see that there is anything in your letter which excuses the apparent neglect of your company to make any attempt to comply with the notice which the Board sent to you some three months ago.

You state that no companies are more desirous than your own to obey the law in good faith, and deprecate the implied discrimination, which you seemed to think my letter contained, between your own and other companies. The fact is that other companies are preparing cables to be placed in the subways, with a view to convert their overhead system into underground systems, while so far as I am able to ascertain, your company has done nothing whatever in this direction.

You state that neither your company nor any other, can, with proper regard to the interests of its stockholders and its duty to protect their interests, hazard its entire business and property by abandoning its present working system before it has assurance of an efficient substitute; as though the question of operating the conductors of electric light companies under ground were an entirely novel and untried experiment, when, in fact, you cannot fail to be aware that the wires of electric lighting companies are being operated under ground in subways similar to, though possibly not as well constructed as those which have been prepared in New York during the last six months, in several cities.

You are misinformed in your understanding that the only wires that have been placed in the conduits are those of the Metropolitan Telephone Company.

In reference to your request that you be allowed to make subsidiary connections and tests in localities where the conduits are laid, involving displacements of curbs and walks, I may say that the Construction Company has been authorized by a resolution of the Board to make connections between the conduits and points desired to be reached by electrical companies, the character of which is specified by the resolution, upon request to that effect from companies desiring to make use of the conduits and such subsidiary connection; and speaking for myself, feeling as I do that the success of the underground service in the conduits prepared by the Board is solely dependent upon the proper selection and insulation and care of the conductors used, I cannot see that it would be proper for the Board to insist upon the Construction Company preparing these connections without being assured that they will be made use of.

In reference to the amount of rental, I may say that the Board has no definite information on that subject. You are at liberty to make your own terms with the Construction Company for the space which you may desire in the subways, but you may rest assured that in case of any unfairness or improper charge for the use of the subways you will meet with a proper and speedy relief at the hands of the Board, which has both the power and the intention of compelling these charges to be both fair and reasonable. While on this subject I may say further that the cost to any particular company, as for instance your own, occupying a part of a subway which also contains the wires of other companies, can undoubtedly be made less than it would be were the entire burden of the subway upon the one company.

Passing now to your suggestion in reference to the duties imposed upon the Board by the Act of 1885, I would remind you, though I am no lawyer, that the plain intent of the Act of 1887, particularly the section which I quoted to you in my last letter, is to render possible the enforcement of the laws relating to the placing of electrical conductors under ground, and it seems to me, as a layman, without the benefit of legal knowledge, that it is absurd to attempt to construe a part of the Act of 1885 in such a way as would render useless nearly the whole of the Act of 1887 were it conceded to be the proper construction, for inasmuch as your particular company sees fit to suggest that its service may be deteriorated by the operation of underground conductors in place of those overhead, notwithstanding similar conductors

are efficiently operated in underground conduits, and that therefore the Commission should make tests which shall satisfy you that there will be no deterioration of your service in using the underground conductors, so in case the Commission should attempt to make tests of the underground subways for your satisfaction you might still hold with equal force that because some wires work underground it would not necessarily follow that yours would.

In conclusion, let me express the hope that, as you say no companies are more desirous than your own to obey the law in good faith, you will proceed to procure conductors for underground service, and, after indicating to the Construction Company what connections you desire shall be made for your use, will proceed to place your conductors in the conduits for operation as speedily as possible.

The operation of the law requiring electrical conductors to be placed underground has been retarded by a variety of causes; not the least of these is the fogs or veil in which the workings of their service have been surrounded by practical electricians. It has been claimed by almost every inventor of an underground system of subways that his system or his particular material was the only one in which practical results could be accomplished; and again, on the other side, it has been held by operators of wires throughout the city that there was no system and no form of subway in which their particular wires could be successfully worked. The plain facts seem to me capable of being summed up as follows: Electrical conductors can be operated underground. This is true of all descriptions of electrical conductors, provided the conductors are properly insulated. Proper insulation can be supplied for the conductors by the companies which operate them, the largest possible liberty in this matter being allowed to the several companies. The subways are nothing more than a mechanical protection to the insulated conductors from external influences and a convenience enabling the getting at and arranging of the conductors. It depends on your company, therefore, to make a success of the changing of your system from a overhead to an underground one by providing yourselves with proper conductors to be placed in the subways; and when you proceed to do this. I am persuaded you will not find the Board of Electrical Control discriminating against your company, or attempting to destroy your service or to force you underground faster than is consistent with your welfare.

Very respectfully,

JACOB HESS, President.

The following communications from Shipman, Barlow, Larocque & Choate and Leonard F. Beckwith were ordered to be spread on the minutes:

35 William Street,

NEW YORK, November 26, 1887.

HON. ABRAM S. HEWITT and others, Commissioners of the Electrical Subway:

GENTLEMEN:—The workmen who are laying the conduits for the Electrical Subway in Broad street have broken the iron pipe which contains the cables of the Commercial Cable Company, and they are apparently proposing, without repairing this pipe sufficiently, to lay down their conduits and leave the pipe broken, protected only by a piece of sheet iron, which will not effectually secure the pipe from being filled with dirt, whereby the cables of the Commercial Cable Company cannot be withdrawn from their pipe in case of necessity for repairs or otherwise.

It seems wholly unnecessary to inflict this injury, as the Commissioners could easily cause the pipe they have broken to be properly repaired.

On behalf of the Commercial Cable Company, we therefore address this note to you in order that the injury may be properly repaired and to prevent litigation, which must follow if the present course of the workmen is persisted in.

From the progress made in the work it seems likely that the injury may be done to-day or on Monday, therefore some prompt action is necessary on the part of the Commissioners.

We are, very respectfully, on behalf of the

COMMERCIAL CABLE COMPANY,
SHIPMAN, BARLOW, LAROCQUE & CHOATE.

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY COMPANY,

No. 18 Cortlandt Street.

NEW YORK, November 28th, 1887.

COL. H. S. KEARNEY, Chief Engineer Board of Electrical Control,

1218 Broadway, New York City, N. Y.:

DEAR SIR:—I take pleasure in acknowledging the receipt of your letter of reference of Shipman, Barlow, Larocque & Choate, addressed to the Hon. Abram S. Hewitt, and others, Commissioners of the Electrical Subway, regarding the breaking of a pipe for the Commercial Cable Company on Broad street, and in reply I desire to state that, prior to the receipt of such communication, the matter had been given attention, and in such a manner that it was entirely satisfactory to the Commercial Cable Co.

Trusting that this will be satisfactory to you and all concerned,

I am, very respectfully yours,

LEONARD F. BECKWITH, Chief Engineer.

The following communication from James W. Smith, President of the Consolidated Gas Company of New York, and answer of President Hess thereto, were ordered to be spread on the minutes:

CONSOLIDATED GAS COMPANY OF NEW YORK,

No. 4 Irving Place.

NEW YORK, November 1st, 1887.

GENTLEMEN:—We are informed that the parties laying the conduits for telegraph wires, etc., under permits granted by your Board, have caused the main pipes laid and in use by this company in Church street, at the corner of and above Vesey street, to be covered by the structure in which telegraph, telephone and electric light wires are to be enclosed, in such manner as to make it practically impossible to reach or repair such mains, to replace them if worn out or to stop leaks if such occur, and to which they are from time to time made liable, in consequence of improvident excavations in the streets and in vaults adjoining.

We were not informed of this in time to enjoin the work, but their action was duly protested against, and such protest disregarded. We are informed that you have ordered many more miles of similar structure to be laid.

We are enjoying, in common with others, the privilege of maintaining mains in the streets of the City to supply public and private buildings and lamps with illuminating gas. Mains laid must needs be communicated with to make and keep in order connections with buildings and lamps, and oftentimes to stop leaks, when careless excavations by other companies or by contractors engaged in public work interfere with the support of our mains and cause leakages. Sometimes these are of a serious and dangerous character, requiring immediate access and action, and it is possible that to repair a break in the main in question it would be necessary to interrupt the telegraphic and telephonic communication of the whole City.

We claim only our rights, but notify you that wherever our mains are laid we claim the rights above stated in regard to them, and that the structure authorized by you must conform thereto. We have no desire to have any difficulty, and it can be easily avoided.

The position of our mains in any street can be obtained in advance by inquiry at this office.

As gas is explosive, and great injury may be done to both life and property, and serious inconvenience caused to the public in consequence of telegraphic or telephonic interruption by disregard on your part of these rights, we beg of you to give due consideration to them when issuing permits to lay subway conduits that such an interference as has just occurred at the point above mentioned be not repeated.

Yours respectfully,

JAS. W. SMITH, President.

To the Board of Electrical Control, JACOB HESS, Chairman, City:

JAMES W. SMITH, Esq., President Consolidated Gas Company of New York,

No. 4 Irving Place, City:

DEAR SIR:—We have yours of the 1st instant in relation to Subway matters and, particularly, the conflict between the gas pipes and our subway construction in Church street, near Barclay.

We are sorry to interfere with the gas pipes in any way, and more sorry that your maps do not show the correct location of the pipes in the streets.

In the particular instance mentioned in your letter, test holes were dug at each end of the block, and no pipes were exposed. We then proceeded to open a trench, by the order of the Commissioner of Public Works, and to lay conduit, and found that your gas main had a bend in it extending into our trench, which was straight from corner to corner (it is necessary for our trench to be in a straight line), so that we had to overlap your gas pipe for a distance of about thirty feet in length, and, perhaps, one-half the diameter of it; but your service pipes were left entirely free, and should you desire to repair and straighten your gas main at any time our construction will not interfere with it in any way.

We are as anxious as you are to avoid conflict in the future. We will not disturb your gas pipes when it is possible to avoid it.

Very respectfully,

JACOB HESS, President Board of Electrical Control.

The following application of Ezra Cornell was read and ordered to be spread on the minutes:

No. 53 Broadway,

NEW YORK, November 7, 1887.

To the Honorable Board of Electrical Control of the City of New York:

The undersigned, desiring employment as an Electrical Expert or engineer, respectfully states that he has for the past five years devoted himself to the study of Electrical science at the Cornell University, and that he graduated in June last in the course of electrical and mechanical engineering at that institution.

For evidence of qualification for the duties named he takes pleasure in referring to the accompanying testimonials from Professor Anthony and Thurston and President White, under whom his studies have been prosecuted.

Very respectfully,

EZRA CORNELL.

The Board ordered the following communication from the Standard Underground Cable Co. to be spread on the minutes and a copy of the rules and regulations of the Consolidated Telegraph and Electrical Subway Co. to be sent to the Cable Co.:

STANDARD UNDERGROUND CABLE CO.

NEW YORK, Dec. 26th, 1887.

The Honorable, the Board of Electrical Control, New York City:

GENTLEMEN:—We are desired by customers of ours in the electric light business to furnish quotations for "Loose wires to be placed in ducts now laid in this City for electric arc lighting; the wires to be made to meet the requirements of the Board of Electrical Control."

We are not aware specifically what requirements this refers to and write to ask that you will be kind enough to instruct us on this point.

Very respectfully,

STANDARD UNDERGROUND CABLE CO.,

G. L. WILEY, Mgr.

DECEMBER 22, 1887.]

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The following communications were read and ordered spread on the minutes:

OFFICE OF THE VICE-PRESIDENT AND GENERAL MANAGER OF
THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.,

No. 18 Cortlandt Street.

NEW YORK, December 21st, 1887.

Board of Electrical Control, 1218 Broadway, New York:

GENTLEMEN:—For your information I beg to say that this company has already removed some 300 miles of wire from Sixth avenue, substituting therefor cables, which were placed in the conduits of the Consolidated Telegraph and Electrical Subway Co.

The contractors of cables have an order for some fifteen miles of cable, of which 49,600 feet, or thereabouts, have been laid in places. It is hoped that for every mile of cable laid by us in the subway, fifty miles of aerial wire can be removed.

An order for some eight miles of cable was offered to the makers to-day by us, but declined on account of the great advance in the price of copper, but I trust that after waiting a few days, we can place this order for eight additional miles of cable, making in all twenty-three miles which we have immediate use for.

Very respectfully,

H. S. HUIDEKOPER, Vice-Pres. and Gen. Man.

COMMISSIONER'S OFFICE, POLICE DEPARTMENT,
OF THE CITY OF NEW YORK, 300 MULBERRY ST.

NEW YORK, December 13th, 1887.

HON. JACOB HESS, President of the Board of Electrical Control,

1218 Broadway:

DEAR SIR:—Your communication of the 17th ultimo, addressed to the Board of Police Commissioners of this City, requesting certain information to be given, was by them referred to me for answer.

In reply thereto I would state that, in my opinion, it will require but a very short time to complete the test of the several systems of Police signalling that are now in operation in the 19th Precinct.

I regret that I am unable to furnish any satisfactory answer to your second inquiry, as to the probability of our selecting any one of these systems now being experimented with, the Board having arrived, up to the present time, at no conclusion in the matter.

Yours very respectfully,

JOHN R. VOORHIS,

Chairman of Committee on Repairs and Supplies.

THE BRUSH ELECTRIC ILLUMINATING CO. OF NEW YORK,

204-210 Elizabeth Street.

NEW YORK, November 28, 1887.

HON. JACOB HESS, President Subway Commission:

DEAR SIR:—The Brush Company have a contract with the City for about one hundred (100) additional lights, in streets where you have no conduits, and while we have permits from the Subway Commission to erect the lampposts to burn those lights, you do not give us permission to erect a carrying pole, which is just as necessary, in order to complete our contract, as it is to erect lampposts, as we cannot stretch our wires from one lamp post to another. It is simply an impossibility without a supporting pole between two lamp posts.

These supporting poles are not used by us for any Commercial Lighting, it is simply a part of the system of lighting the City and is emphatically, what we call it, a supporting pole to carry the wire between two lamp posts, and it is an impossibility for us to complete our contract with the City without permission to put up these supporting poles. It is just one pole between two lamp posts and unless your Commission will give us a permit to erect these intervening poles we shall have to abandon additional lighting to the City.

Respectfully yours,

W. L. STRONG, President Brush Electric Ill. Co.

The Committee on Lamp Posts submitted to the Board the following report:

The Special Committee on Lamp Posts for electric lights appointed by resolution of the Board at the last meeting respectfully reports as follows:

The committee invited representatives of the different electric lighting companies and others interested in the subject, including several experts in electrical engineering, to meet at the office of the Board, in order that a full discussion might be had as to the relative merits of the different materials advocated for lamp posts, and after hearing the statements made by those present, adopted as the standard lamp post for electric lighting a wooden mast set in an iron base or socket—this form of post appearing to the committee to combine all the essential advantages of the various forms presented, a descriptive drawing of which is attached to this report.

Following the adoption of this form of lamp post, applications were made to the Committee by the electrical lighting companies to whom contracts for City lighting have been awarded by the Gas Commission, and permission to erect lamp posts at the points designated by those contracts were granted to the different companies as follows:

NORTH NEW YORK LIGHTING COMPANY.

North Third avenue, from Harlem Bridge to 150th street.

138th street, from Third avenue to Madison Avenue Bridge.

BRUSH ELECTRIC ILLUMINATING COMPANY.

Northeast corner of 14th street and Fourth avenue.

Southeast corner of 15th street and Fourth avenue.

Northeast corner of 16th street and Fourth avenue.

Northeast corner of 17th street and Fourth avenue.
Avenue A, from 14th to 59th streets.
Grand street, from Broadway to Sullivan street.
Avenue B, from 14th to 22d streets.
Irving Place, from 14th to 20th streets.
8th street, from Third avenue to East River.

MOUNT MORRIS ELECTRIC LIGHT COMPANY.

Greenwich street, from Battery Place to Warren street.
Barclay street, from Washington to Greenwich streets.

EAST RIVER ELECTRIC LIGHT COMPANY.

Broadway, Canal to 14th street.
Park Row, Ann to Bowery.
Grand street, Broadway to East River.
Desbrosses street, West to Canal street.
Eighth street, Sixth avenue to Cooper Union.
Eighth avenue, 14th street to 59th street.
Sixth avenue, Carmine to 59th street.
Bowery, Park Row to Third avenue.
Third avenue, Bowery to 86th street.
Avenue B, Houston to 14th street.
Avenue D, Houston to 14th street.
First avenue, Houston to 14th street.
Fourth avenue, Bowery to 14th street.
Centre street, Brooklyn Bridge to Grand street.
Christopher street, Sixth avenue to West street.
Houston street, North River to East River.
Stuyvesant street, 8th street to 10th street.
Tenth street, Second avenue to East River.
Tenth avenue, 14th street to 59th street.
West Broadway and South 5th avenue, from Chambers street to Washington Sq.

HARLEM LIGHTING COMPANY.

Third avenue, from 86th street to 130th street.
125th street, from First avenue to Fourth avenue.
Eighth avenue, from 120th street to 155th street.
125th street, from Eighth avenue to Manhattan avenue, and from Manhattan avenue to North River.

The East River Electric Light Company, which had the largest contract for lighting, necessitating the use of over five hundred lamp posts, represented to the committee that, owing to the shortness of the time remaining to them to place their lamp posts in position, it would be impossible for that company to procure the necessary number of iron bases required by them, and that unless some modification of the rule were allowed the company, the adoption of this form of pole by the Committee would deprive the City of lamps on the streets included in its contract. In the case of this company the committee, therefore, modified its permit to the extent of allowing a wooden pole similar in design to the one adopted, but without the iron base, in such streets and avenues as could not be provided with the other pole in the time allowed.

The companies receiving the permission alluded to have, in many cases, erected the post called for by the plan of the Committee, and an inspection of the post, after it has been placed in position, confirms the committee in the wisdom of its choice. The post appears to be strong, serviceable and ornamental, and the iron base promises the greatest durability, while the wooden top secures the safety of linemen from grounds while working on the posts. The iron base on the lamp post also allows of an easy and safe connection with underground conduits, when the latter shall have been prepared.

The committee is informed that in certain parks in the City posts have been erected since the last meeting of the Board, without permits from the Board of Electrical Control, but under permission of the Park Commission. The act regulating the construction of fixtures for electrical conductors overhead contains the following words: "Except with such permission, no electrical conductors, poles or other fixtures or devices therefor, nor any wires, shall hereafter be continued, constructed, erected or maintained or strung above ground in any part of said City." And again: "The said Board of Electrical Control may establish, and from time to time may alter, add to or amend all proper and necessary rules, regulations and provisions for the manner of use and management of the electrical conductors." It occurs to the committee that it would be well for the Board to ascertain the view of the Corporation Counsel as to the powers and duties of the Commissioners in regard to the electrical conductors in the public parks of the City, and as to whether these are under the control of this Board or exclusively under the control of the Commissioners of Parks.

All of which is very respectfully submitted.

JACOB HESS,

HENRY S. KEARNY,

Committee on Lamp Posts.

In addition to the above, permits have been granted to the United States Illuminating Company to erect the lamp post adopted by the Committee in the following streets:

New Chambers street, from Broadway to East River.

Whitehall street, from Bowling Green to Ferry.

Liberty street, from Broadway to North River.

Cortlandt street, from Broadway to North River.

Barclay street, from Broadway to North River.

And to the American Electric Manufacturing Company in the following streets:

Boulevard, 110th to 155th street.

110th street, Boulevard to Sixth avenue.

Sixth avenue, 110th to 136th street.

JACOB HESS,

HENRY S. KEARNY,

Committee on Lamp Posts.

Commissioner Gibbens offered the following resolution:

Resolved, That the report of the Committee on Lamp Posts be adopted by the Board, and that the Secretary inquire, in the name of the Board, of the Corporation Counsel, "as to the duties of the Department of Public Parks in regard to the electrical conductors in the public parks of the City, and as to whether they are under the control of this Board or exclusively under the control of that Department."

Adopted by a unanimous vote.

The following communication from Chief Engineer Kearny was read and ordered spread on the minutes:

OFFICE OF
THE BOARD OF ELECTRICAL CONTROL.
NEW YORK, December 21, 1887.

To the Board of Electrical Control:

GENTLEMEN:—At the close of the active operation of the Construction Company, under your direction, for the year, I have the honor to submit the following report of the work completed.

The total length of trench excavated since July, 1887, is 129,918 feet. Total construction of conduit, single duct, for telephone and telegraph service, 903,180 feet, and for distributing service and connections with central stations 4,050 feet.

Estimating eighty wires per duct, the total capacity of this construction is 72,254,400 feet, or about 13,700 miles of wire.

The total length of conduit for arc light and power wires aggregates 254,250 feet of single duct. The capacity of this conduit may be estimated as sufficient to contain 2,542,500 feet of wire. In addition to the above the number of feet of incandescent light conduits laid aggregates 186,745 feet, containing 560,235 feet of conductors.

The construction of these conduits has been in the main, in strict accordance with your specifications, and, except in a few instances, where improvements and alterations are needed, satisfactory.

The companies which are using the conduits at present are the Western Union, which has about 500 miles of wires between Exchange Place and the Brooklyn Bridge, the Metropolitan Telephone Company, which has some thousand miles of wire in the Sixth avenue conduit, and the Edison Electric Illuminating Company, whose conductors were laid in the trenches at the time of excavation.

The Metropolitan Telephone Company and the Western Union Company, as well as the Brush Electric Light Company and others, are preparing to enter the conduits at many points, and so far as I am able to ascertain the Board has provided for a greater mileage of underground wires and will soon have larger mileage of wires underground than there is in any city in the United States, probably in the world.

The liberality which the Commission has seen fit to exercise in the matter of additions to the conduit, for the purpose of making local connections, allowing the Construction Company practically to furnish whatever the several companies desired for

themselves, from the manholes to the points desired to be reached, has been taken advantage of and promises beneficial results. For example, the Construction Company has in at least one instance employed the Handhole system of distribution for the Telephone Company in a down-town street, where it seemed desirable, while, at other points, a single entrance into a block, in connection with housetop distribution, has proved sufficient.

The way in which the resolution notifying companies to place their wires in the subways is drawn, practically allows the company operating wires to select their methods of getting from the manhole to their own subscribers, while, at the same time, the authority of the Commission over the Construction Company and its work, as well as the supervision of the Construction Company itself over the underground accommodations, is preserved.

In a city where the surrounding circumstances are so varied, as is the case in New York, the requirements of each particular locality and service must be taken into consideration, and the particular result to be attained must of necessity largely govern the means employed for its accomplishment.

Very respectfully,

HENRY S. KEARNY, Chief Engineer.

Commissioner Gibbens moved the following resolution:

Resolved, That a committee of one be appointed by the Chairman of the Board to draft a report showing the work of the Commission during the past year, to be submitted to the Legislature.

Adopted by a unanimous vote.

Resolved, That the Secretary be directed to send the usual notice, approved by the Corporation Counsel, to companies operating electric light wires on the following streets and avenues on which sufficient accommodations have been provided underground for the operation of their conductors, to wit:

Broadway, from 14th to 45th street.
19th street, from 6th avenue to 5th avenue.
23d street, from 6th avenue to 4th avenue.
24th street, from 6th avenue to Broadway.
25th street, from 6th avenue to Broadway.
26th street, from 6th avenue to Broadway.
27th street, from 6th avenue to Broadway.
28th street, from 6th avenue to Broadway.
6th avenue, from 24th to 50th streets.

Also to telegraph and telephone companies operating conductors on the following streets and avenues:

6th avenue, from 9th to 22d street.
Broadway, from 15th to 44th street.
Madison avenue, from 23d to 40th street.
Broadway, from Pearl (north) to Vesey street.
Park Row, from Ann to New Chambers street.
Broad street, from William to Exchange Place.

Exchange Place, from Broad to New Church street.

Barclay street, from Church to College Place.

College Place, West Broadway and South 5th avenue, from Church to Spring street.

Spring street, from Broadway to South 5th avenue.

Greene street, from Spring to Houston street.

Cortlandt street, from Broadway to Church street.

18th street, from Broadway to 6th avenue.

32d street, from Broadway to 5th avenue.

38th street, from 4th avenue to Broadway.

42d street, from 5th avenue to Broadway.

45th street, from Vanderbilt Place to 6th avenue.

Adopted by a unanimous vote.

Resolved, That the Mayor be requested to order the removal by the Commissioner of Public Works, through the Bureau of Incumbrances, of the following wires, poles and other fixtures, the ninety days' notice required by law having expired without their being removed by the owners or operators thereof, to wit:

1. All the wires of the Metropolitan Telephone and Telegraph Company on poles on Sixth avenue, from 22d to 32d street, in number from fifteen to thirty-eight.

2. All the poles of the Metropolitan Telephone and Telegraph Company, or lately used by the said Company on Sixth avenue, from 22d to 32d streets, being in number twenty (except such as may be required pending the placing under ground of the wires of the Fire and Police Departments).

3. All the poles and wires of the United States Illuminating Company on the north side of 25th street, between Sixth avenue and Broadway, being about 11 wires and 5 poles, the poles on corner of Broadway and of Sixth avenue excepted.

Adopted; Mayor not voting, others voting "aye."

Adjourned.

Minutes of a meeting of the Board of Electrical Control to consider the annual report to the Governor and the Legislature, held at the office of the Mayor, in the City of New York, on Friday, January 6th, 1888, at 12 o'clock noon.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess, President; Daniel L. Gibbons and Theodore Moss.

On motion of Commissioner Moss the reading of the minutes of the previous meeting was dispensed with.

President Hess stated to the Board that he had appointed Commissioner Gibbons a committee of one to draft a report to the Governor and the Legislature, and called on the Commissioner to present it.

Commissioner Gibbons thereupon read his report, a printed copy of which is on file in the office of the Board.

FIRST REPORT OF THE BOARD OF ELECTRICAL CONTROL FOR THE CITY
OF NEW YORK, ADOPTED UNANIMOUSLY, JANUARY 6TH, 1888.

To the HON. DAVID B. HILL, Governor of the State of New York,
and the Members of the Legislature:

GENTLEMEN:—During the last session of the Legislature, a report of the Board of Commissioners of Electrical Subways for the City of New York was presented, showing the adoption of a general plan of construction of subways for electrical conductors under the advice of the Attorney-General of the State, and the commencement of the work of carrying out that plan.

The report said, briefly, that it had been established to the satisfaction of the Board that the problem of removing the electrical conductors from the surface of the streets and placing them underground, was rather one of a mechanical than of an electrical nature; that a conduit is nothing more, electrically and mechanically speaking, than a protection for the wires and a method of placing them underground; and that a proper plan for the construction of conduits in the city of New York must necessarily be one determined in each particular locality, and for each particular service, according to the nature of the service and the peculiar conditions affecting the locality.

The report showed that an agent had been found for the construction of this general plan throughout the city, and that some two miles of conduit capable of containing 2,500 miles of wire had been built on Sixth avenue, from 21st to 59th streets, in which underground conductors were already being satisfactorily operated.

A Court had, however, denied the legality of the proceedings of the Board, and it had become necessary to appeal to the Legislature for an interpretation of the Acts constituting the Board of Commissioners for Electrical Subways, and an indication whether the construction of those Acts rendered by the Attorney-General and acted upon by the Board, or that of the Judge sitting in Court, was to be followed.

As a result of that situation of affairs the Legislature enacted the Subway Act of 1887, doing away with the Board of Commissioners of Electrical Subways, and constituting the Board of Electrical Control.

THE PRESENT SITUATION.

The state of affairs in New York under this Act may be briefly summed up as follows:

A Commission of four members, one of them being the Mayor of the city, ex-officio, is constituted, with full authority over all the electrical conductors in the City of New York, and with the special ministerial duty of changing the present overhead systems to underground systems by the providing of subways suitable for occupancy by the companies doing business at present with overhead conductors.

A Construction Company (the Consolidated Telegraph and Electrical Subway Company) is authorized to construct the subways designed by the Commission, and to permit the use of them by electrical companies upon fair and impartial terms.

Over the excavations of this Construction Company in the streets, the local authorities, represented by the Commissioner of Public Works, have full control.

Its profits are limited to ten per cent. on the money actually invested by it in carrying out the directions of the Commission—the excess going to the City; and to all its books and accounts the local authorities, represented by the Comptroller, have access.

A provision of law makes it incumbent upon the Board to give to companies operating conductors overhead ninety (90) days of notice for the removal of their overhead wires after a sufficient construction of subways has been made ready in any street or locality—reference being had to the general direction of the wires in use; and in the event of the companies so notified not removing their poles and wires from the street before the expiration of the ninety days of notice, it is provided that the local authorities shall thereupon remove them.

This state of affairs would seem to be admirably adapted for the fulfillment of the task imposed upon the Board; and immediately upon the passage of the Act, that is to say, upon the 5th day of July, 1887, the Board of Electrical Control organized at the office of the Mayor, received from the Board of Commissioners of Electrical Subways all its books, papers and other property, and proceeded to the work for which it was constituted.

THE WORK OF THE BOARD.

The total length of trench excavated for the laying of subways since July, 1887, is 189,918 feet.

The total construction of single duct for telephone and telegraph service is 903,180 feet, to which must be added 4,050 feet for distributing service and connections to central stations.

Estimating 80 wires per single duct, the total capacity for telegraph and telephone service is 72,254,400 feet, or about 13,700 miles, of wire.

The total construction of single duct conduit for arc lighting and power service is 254,250 feet, and the capacity of this conduit may be estimated as sufficient for 2,542,500 feet, or nearly 500 miles of wire.

In addition to the above the number of feet of conduit for incandescent lighting is 186,745, containing 560,235 feet of conductors.

The streets and avenues on which subways for telegraph and telephone conductors have been laid are the following:

- Sixth avenue, from 9th to 59th streets.
- Broadway, from 15th to 44th streets.
- Madison avenue, from 23d to 40th streets.
- Broadway, from Pearl street north to Vesey street.
- Park Row, from Ann to New Chambers streets.
- Broad street, from South William street to Exchange Place.
- Exchange Place, from Broad to New Church streets.
- Barclay street, from New Church street to College Place.
- Church street, from Exchange Place to Barclay street.
- College Place, West Broadway and South Fifth avenue to Spring street.
- Spring street, From Broadway to South Fifth ave.
- Greene street, from Spring to Houston streets.
- Cortlandt street, from Broadway to Church street.
- 18th street, from Broadway to Sixth avenue.
- 32d street, from Broadway to Fifth avenue.
- 38th street, from Fourth avenue to Broadway.
- 42d street, from Fifth avenue to Broadway.
- 45th street, from Vanderbilt Place to Sixth avenue.

The streets and avenues on which subways for arc lighting and power conductors have been laid, are the following:

- Broadway, from 14th to 45th streets.
- 19th street, from Sixth to Fifth avenues.
- 23d street, from Sixth to Fourth avenues.
- 24th street, from Sixth avenue to Broadway.
- 25th street, from Sixth avenue to Broadway.
- 26th street, from Sixth avenue to Broadway.
- 27th street, from Sixth avenue to Broadway.
- 28th street, from Sixth avenue to Broadway.
- 42d street, from Sixth avenue to Broadway.
- Sixth avenue, from 18th to 50th streets.

The streets and avenues on which the conductors of the Edison Illuminating Company have been laid for incandescent lighting, are as follows:

- 18th street, from Broadway to Sixth avenue.
- 19th street, from Broadway to Sixth avenue.
- 20th street, from Broadway to Fifth avenue.
- 21st street, from Broadway to Sixth avenue.
- 23d street, from Fourth to Sixth avenues.
- 24th street, from Broadway to Sixth avenue.
- 26th street, from Fifth to Sixth avenues.
- 27th street, from Fifth to Sixth avenues.
- 28th street, from Fifth to Sixth avenues.
- 29th street, from Fifth to Sixth avenues.
- 30th street, from Fifth to Sixth avenues.
- 31st street, from Fifth to Sixth avenues.
- 32d street, from Fifth to Sixth avenues.
- 33d street, from Fifth avenue to Broadway.

34th street, from Fifth to Sixth avenues.
35th street, from Fifth to Sixth avenues.
36th street, from Third to Sixth avenues.
37th street, from Fourth to Sixth avenues.
38th street, from Fourth to Sixth avenues.
39th street, from Fifth avenue to Broadway.
40th street, from Fifth avenue to Broadway.
42d street, from Fifth avenue to Broadway.
Madison avenue, from 36th to 38th streets.
Fourth avenue, from 36th to 38th streets.
Broadway, from 14th to 45th streets.
Sixth avenue, from 18th to 50th streets.

On all these streets and avenues the companies whose wires have been provided for have been directed to remove their poles and wires from the surface within ninety days, and at the expiration of that time, in case they are not so removed, it becomes possible and proper for the local authorities to remove them forthwith.

The Board is informed that no money has been provided by law to enable the local authorities to make these removals.

The capacity of conduit provided in the city of New York during the existence of the Board of Electrical Control is therefore considerably greater than there is in any city in the world, so far as the information of the Board extends; and notwithstanding the great difficulties which surround this whole subject in this city, which has a greater mileage of wire than any other, and where the circumstances of underground construction are as difficult as in any other, the conversion of the present overhead to an underground system is a fact about to be accomplished, to a very great extent at least, in the near future.

Already the Western Union Telegraph Company is occupying the conduits which have been constructed, with some five hundred miles of wire. The Metropolitan Telephone and Telegraph Co. has some one thousand miles of wire in the subways; and the Edison Illuminating Company, whose conductors were laid in the trench at the time of construction, has, as has already been said, more than one hundred miles underground.

The Metropolitan Telephone and Telegraph Company, the Western Union Telegraph Company, the Brush Electric Light Company, and others, are preparing to enter the subways at many points, and should the efforts of the Board be seconded by energetic action on the part of the local authorities when the ninety days of notice has expired, many of the streets must necessarily be freed from the dangerous and unsightly pole systems.

The policy of the Board is to insist upon the electrical companies converting their overhead systems to underground systems as rapidly as is consistent with the convenient use of their service by the public, and where companies in good faith are making preparations to enter the subways, no harsh measures seem desirable.

So many considerations of preparing proper conductors, drawing them in, making connections, and testing their efficiency, enter into the problem of removing overhead wires from any particular street or locality, that in very many cases the ninety days allowed by law may very properly be extended and must be extended to avoid serious injustice to the companies and inconvenience to their customers.

In cases where preparations are not being made, however, or where poles and wires are abandoned, as is the case in one instance already, the remedial clause of the law should be rigorously enforced, and every effort will be made by the Board to that end.

POLES AND WIRES TAKEN DOWN.

The actual number of poles and wires removed from the surface of the streets as a result of the work of the Board, is as follows:

On east side of Third avenue, between 46th and 110th streets.....	127 poles.
On east side of Ninth avenue, between 17th and 50th streets.....	75 "
On 55th street, between Second avenue and East River.....	15 "
	<hr/>
	217 "
On east side Third avenue, from 46th to 110th streets.....	17 wires.
On Avenue A and First avenue, from 5th to 55th streets.....	12 "
On 55th street, from Tenth avenue to North River.....	47 "
On Eleventh avenue, from 15th to 55th streets.....	16 "
On Sixth avenue, from 20th to 58th streets.....	155 "

Making a total of about 500 miles of wire.

In addition to the above, the local authorities have been requested to remove the following wires, poles and fixtures, the ninety days of notice having expired:

All the wires of the Metropolitan Telephone and Telegraph Company on Sixth avenue, from 22d to 32d streets, in number from 15 to 38.

All the poles of the Metropolitan Telephone and Telegraph Company, or lately used by that company, on Sixth avenue, from 20th to 32d streets, in number 20; except such as may be required by the Fire and Police Departments.

All the poles and wires of the United States Illuminating Company on 25th street, from Broadway to Sixth avenue; the poles on the corners of Broadway and Sixth avenue excepted.

FIRE AND POLICE WIRES.

A very much greater number of poles could have been removed had the wires of the Fire and Police Departments been provided for by the local authorities; these wires being practically outside of the control of the Board, as well as the poles which are necessary to their support.

The Board is, however, informed that active measures are being taken to provide underground conductors for this service.

THE CONDITION OF OVERHEAD WIRES.

The duties of the Board extend to the making and enforcing of rules and regulations for the continuance of the wires overhead where this is necessary, either before the subways are completed or in connection with the subways after they are built.

Very little progress has been made by the Board in this direction.

The telegraph and telephone services are, except in the case of fires, of very little danger; and, in the main, wires devoted to this service are in good condition.

The electric light conductors, however, are very dangerous both to life and property whenever improperly insulated; and improper insulation of these dangerous and deadly wires is to be found almost everywhere throughout the city. The only regulations affecting the use of electrical conductors in the city of New York prior to the organization of this Board were a few resolutions of the Board of Aldermen which have never been, so far as this Board is able to ascertain, at all regarded or complied with; and the provisions of the Fire Underwriters in reference to the insulation of the arc lighting and power wires, which though probably sufficient to protect property if strictly adhered to, are of little avail owing to the absence of proper inspection and supervision of the wires from time to time, as their insulation becomes affected by the elements and by natural decay and deterioration.

The chief provisions of the Board of Underwriters are to the effect that the electric light wires must be of the kind known as "underwriter's wire," and that they must not in any case be carried over buildings.

"Underwriter's wire" is a wire covered with a tape saturated with white lead, and a certain length of usage renders it susceptible to moisture. After being in use still longer the tape rots away and leaves the naked wire exposed.

In many places in the City of New York electric light and power wires are carried dangerously near buildings, awnings, telegraph and other poles, lampposts and other street obstructions.

Again, in many parts of this city several distinct lines of poles carrying electric light conductors are to be found on the same side of the same street, and as these poles necessarily differ in height the wires upon them form a complete network, rendering the efficient use of the hooks and ladders and life-saving apparatus of the Fire Department almost impossible; whereas the placing of all the wires on the same side of any street upon one line of poles would in a great measure obviate this difficulty.

Again, a nuisance has been created by the fact that companies having contracts to light the City by electric light are allowed to own the lamp-posts they use, which necessitates frequent tearing up of the pavements when any new contracts are awarded.

The Board has endeavored to find a remedy for some of these dangers and difficulties in rules and regulations which it has established for the government of the overhead wires, and which are appended to this report. (See appendix A.)

Owing, however, to the lack of inspectors, who cannot be employed so long as payment for their services is a question of such delay and doubt, few improvements have been made in the condition of the overhead service, and little attention is paid to the rules and regulations of the Board.

A thorough inspection, classification and reconstruction (so far as it is to be continued after completion of the subways) of the overhead service is a duty to which the Board will turn its attention as soon as possible, and it is believed that with the rules and regulations already adopted, amended and added to as shall seem proper from time to time, the dangers and complications of the overhead wires may be materially diminished.

THE CONDITION OF THE WIRES UNDERGROUND.

In inaugurating the underground system the Commission has followed certain principles which may be defined as follows:

First.—A conduit or subway for electrical conductors is nothing more than a mechanical protection for the wires within it, and a convenience for placing and protecting them underground.

Second.—Electric light and power conductors should, as a matter of precaution if not of necessity, be operated separately, and as far as possible from those for the transmission of currents of lesser intensity.

Third.—The material and form of the subway should depend largely upon the requirements of the locality and the service for which it is designed.

Fourth.—Drawing-in-and-out conduits with convenient manholes are, in the main, the most desirable for the streets of this city, where a condition of the law allowing the companies ninety days to place their conductors in the subways after they are constructed, necessitates that the subways shall be easily accessible without serious disturbance of the pavement.

Fifth.—The success of the underground service depends largely upon the proper insulation of the wires, and the largest liberty compatible with the preservation of the rights of others should be allowed to the companies making use of the subways.

Sixth.—The nature of local connection depends to a great extent upon the service and locality for which they are designed, and here again liberty of choice under proper restrictions may reasonably be allowed.

Proceeding from these general principles the Board has constructed subways in different localities largely differing in design, size and material.

The subways, however, with the exception of the construction for the Edison Incandescent plant, are all on the drawing-in-and-out pattern, which means, a tube or series of tubes or ducts through which cables or insulated wires can be drawn, terminating at distances of about 200 feet in boxes or manholes to which access can be had from the street by removing an iron cover. A drawing showing the mode of placing wires in these ducts is appended.

ELECTRICAL CONNECTIONS.

The liberality which the Commission has seen fit to exercise in the matter of additions to the conduits for the purpose of making local connections, allowing the Construction Company to furnish whatever the several companies desire for themselves from the manholes to the points desired to be reached, has been taken advantage of and promises beneficial results.

For example: the Construction Company has at least in one instance employed the hand-hole system of distribution for the use of the telephone wires in down-town streets where it seemed desirable, while at other points a single entrance into a block in connection with house-top distribution has proved efficient.

The way in which the resolution notifying companies to place their wires in the subways was drawn, practically allows the companies operating wires, to select their own methods of getting from the manholes to their subscribers, while at the same time the authority of the Commission over the Construction Company and its work, as well as the supervision of the Construction Company itself over the underground accommodations, is preserved.

Diagrams showing the different modes of distribution are appended.

THE REGULATION OF THE SUBWAYS.

The requirements in the nature of safeguards to be observed by companies placing their wires in the subways, have not as yet been fully completed, and must necessarily be largely modified in the future by the experience gained in the practical use of conductors underground.

Some regulations have, however, been submitted to the Board by the Construction Company, and these, together with some additions suggested by Mr. Park Benjamin, the electrical expert, are also appended. (See appendix B.)

The principle which will decide these requirements more fully, as the work of operating conductors underground becomes more complicated, is: the largest possible liberty to the electrical companies compatible with the preservation of the interests of others and the safety of the subways themselves.

A system of inspection of the subways and the wires within them, and their maintenance free from moisture and gases, is another duty to which the Board is giving and will give its attention, and in this, too, it has been seriously impeded by the uncertainty of the payment of inspectors, should it employ them.

EXPENSES OF THE BOARD.

This doubt as to the payment of its expenditures is, as already intimated, a serious detriment to the efficiency of the Board.

The collection from the electrical companies of the moneys appropriated for the Board of Commissioners of Electrical Subways and the Board of Electrical Control, has proceeded so slowly that up to the present time arrears of pay are due to the officers and employees of the Board from January, 1887, while other accounts are outstanding for debts contracted even prior to that date.

A liberal appropriation, which shall enable the employment of competent inspectors to classify the overhead wires with a view to their being placed in proper condition, and to supervise the subways and the wires within them, and which will also enable the fulfillment of obligations to the officers, employees and creditors of the Board, is therefore suggested.

All of which is very respectfully submitted.

NEW YORK, January 6th, 1888.

APPENDIX A.

Report of the Committee on Overhead Wires to the Board of Electrical Control.

NEW YORK, July 15th, 1887.

To the Honorable, The Board of Electrical Control:

GENTLEMEN:—The undersigned to whom were referred the proposed rules and regulations offered by Commissioner Gibbens, respectfully report the annexed rules and regulations and recommend their adoption by the Board. No doubt experience will demonstrate the advisability of extensive modifications of and additions to these rules. They are therefore recommended as in many respects tentative and not as embodying a code from which it would be undesirable to depart.

Rules XV. and XVI. are framed in accordance with the views of the Commissioner of Public Works and upon his recommendation.

Forms of application for permits and forms of permits are hereto annexed and submitted to the Board with the recommendation that the rules and regulations of the Board be printed on the back of each application and permit. These forms are recommended for adoption.

Respectfully submitted,

HENRY R. BEEKMAN, Acting Mayor, Committee.

RULES AND REGULATIONS.

- I. No two lines of poles shall be on the same side of any street or avenue.
- II. No two lines of poles bearing conductors or similar electrical service shall be on any street or avenue.
- III. Electric light poles shall be of iron at least twenty-five feet in height with a diameter of not more than eight inches at the base, and having cross arms of wood with glass, porcelain or rubber insulators, and painted a uniform color.
- IV. Poles for telegraph, telephone and other similar wires shall be at least sixty feet in height.
- V. Poles shall be placed upon the sidewalk as near the curb as possible, and no pole shall be placed within ten feet of any lamp-post or other pole.
- VI. All existing regulations of the local authorities in regard to the placing of poles and stringing of wires are to continue in force.
- VII. All wires shall be fastened upon poles or other fixtures with glass, porcelain or rubber insulators.
- VIII. No wires shall be stretched within one foot of any pole without being attached to the same with glass, porcelain or rubber insulation.
- IX. No wires shall be stretched within twenty feet of the ground or within four feet of any building except when attached thereto with glass, rubber or porcelain insulators.
- X. No arc electric light or power wires shall be stretched over any part of any house or other building.
- XI. The companies or persons owning or controlling poles in any street or avenue shall allow the same to be used by other companies or persons operating conductors for similar electrical service when authorized so to do by the Board, on tender of proper compensation to be determined by agreement between the parties interested. In default of such agreement the amount of such compensation shall be determined by the Board. This rule imports a contract on the part of each company or person owning or controlling the poles in any street or avenue, not only with the Board but also with each company or person who shall under its terms be qualified to demand the privileges it confers.
- XII. All permits of the Board for overhead wires and fixtures are granted only pending the providing of underground accommodations in the neighborhood of the street or avenue for which the permit is granted.
- XIII. Any member or officer of the Board, and every inspector employed by it, as well as every member of the police force of the city, shall be entitled to examine permits under which work of any kind is being done.

XIV. No permit shall be granted for the erection of any overhead structure nor for the renewing of any lines already existing in any street, avenue or highway in which underground accommodations for the service have been provided, or are being provided.

XV. All poles now standing or to be hereafter erected shall be branded or stamped with the initials of the company owning them, at a point not less than five or more than seven feet from the street surface

When an old pole is taken down it must be removed from the street the same day.

New poles must not be brought upon any street more than two days in advance of their erection.

Any pole that shall lie on any street more than two days shall be removed by the Bureau of Incumbrances of the Department of Public Works, at the expense of the party owning it.

XVI. All electrical companies or persons having poles in the public streets shall give a bond to the City in a reasonable amount, to be determined in each case by the Board, conditioned for the payment of the cost of removing dangerous and abandoned poles, and also for the payment of the expense of restoring the sidewalks and pavements where the same have been disturbed or injured in consequence of the erection or removal of any pole owned by them.

XVII. The violation of any of the rules and regulations of the Board, shall operate ipso facto by a revocation of the permit held by the company or person guilty of such violation.

RESOLUTION RELATIVE TO OWNERSHIP OF POLES AND LAMP-POSTS.

Resolved, that whenever hereafter any company shall be permitted by this Board or its successors to erect posts or poles or other fixtures, bearing lamps or other devices for the purpose of lighting by electricity, the streets, avenues, highways, parks or public places of the city, the said permission shall be granted only subject to the following provisions, and the same is hereby expressly made a condition of said permits:

At any time when by action of the city authorities the contract for lighting any such street or other public place shall be given to another company, the company erecting said lighting fixtures or lamp-posts shall, on tender of the first cost thereof, yield possession and ownership of the same to the said other company obtaining the new contract.

REPORT OF THE COMMITTEE ON LAMP-POSTS.

The Committee on Lamp-posts submitted to the Board the following report:

The Special Committee on Lamp-posts for electric lights appointed by resolution of the Board at the last meeting respectfully reports as follows:

The committee invited representatives of the different electric lighting companies and others interested in the subject, including several experts in electrical engineering, to meet at the office of the Board, in order that a full discussion might be had as to the relative merits of the different materials advocated for lamp-posts, and after hearing the statements made by those present, adopted as the standard lamp-post for electric lighting a wooden mast set in an iron base or socket—this form of

post appearing to the committee to combine all the essential advantages of the various forms presented—a descriptive drawing of which is attached to this report. (See page 18.)

Following the adoption of this form of lamp-post, applications were made to the committee by the electrical lighting companies to whom contracts for city lighting have been awarded by the Gas Commission, and permission to erect lamp-posts at the points designated by those contracts were granted to the different companies as follows:

NORTH NEW YORK LIGHTING COMPANY.

North Third Avenue, from Harlem Bridge to 150th Street.
138th Street, from Third Avenue, to Madison Avenue Bridge.

BRUSH ELECTRIC ILLUMINATING COMPANY.

Northeast corner of 14th Street and Fourth Avenue.
Southeast corner of 15th Street and Fourth Avenue.
Northeast corner of 16th Street and Fourth Avenue.
Northeast corner of 17th Street and Fourth Avenue.
Avenue A, from 14th to 20th Streets.
First Avenue, from 14th to 59th Streets.
Grand Street, from Broadway to Sullivan Streets.
Avenue B, from 14th to 22d Streets.
Irving Place, from 14th to 20th streets.
8th street, from Third Avenue to East River.

MOUNT MORRIS ELECTRIC LIGHT COMPANY.

Greenwich Street, from Battery Place to Warren Street.
Barclay Street, from Washington to Greenwich Street.

EAST RIVER ELECTRIC LIGHT COMPANY.

Broadway, Canal to 14th Street.
Park Row, Ann to Bowery.
Grand Street, Broadway to East River.
Desbrosses Street, West to Canal Street.
8th Street, Sixth Avenue to Cooper Union.
Eighth Avenue, 14th Street to 59th Street.
Sixth Avenue, Carmine to 59th Street.
Bowery, Park Row to Third Avenue.
Third Avenue, Bowery to 86th Street.
Avenue B, Houston to 14th Street.
Avenue D, Houston to 14th Street.
First Avenue, Houston to 14th Street.
Fourth Avenue, Bowery to 14th Street.
Centre Street, Brooklyn Bridge to Grand Street.
Christopher Street, Sixth Avenue to West Street.
Houston Street, North River to East River.
Stuyvesant Street, 8th Street to 10th Street.
10th Street, Second Avenue to East River.
Tenth Avenue, 14th Street to 59th Street.
West Broadway and South Fifth Avenue, from Chambers Street to Washington Square.

HARLEM LIGHTING COMPANY.

Third Avenue, from 86th Street to 130th Street.

125th Street, from First Avenue to Fourth Avenue.

Eighth Avenue, from 120th Street to 155th Street.

125th Street, from Eighth Avenue to Manhattan Avenue, and from Manhattan Avenue to North River.

The East River Electric Light Company, which had the largest contract for lighting, necessitating the use of over 500 lamp-posts, represented to the committee that, owing to the shortness of the time remaining to them to place their lamp-posts in position, it would be impossible for that company to procure the necessary number of iron bases required by them, and that unless some modification of the rule were allowed the company, the adoption of this form of pole by the committee would deprive the city of lamps on the streets, included in its contract. In the case of this company, the Committee, therefore, modified its permit to the extent of allowing a wooden pole similar in design to the one adopted, but without the iron base, in such streets and avenues as could not be provided with the other pole in the time allowed.

The companies receiving the permission alluded to have, in many cases, erected the post called for by the plan of the Committee, and an inspection of the post, after it has been placed in position, confirms the Committee in the wisdom of its choice. The post appears to be strong, serviceable, and ornamental, and the iron base promises the greatest durability, while the wooden top secures the safety of linemen from grounds while working on the posts. The iron base on the lamp-post also allows of an easy and safe connection with underground conduits, when the latter shall have been prepared.

The Committee is informed that in certain parts of the city, posts have been erected since the last meeting of the Board, without permits from the Board of Electrical Control, but under permission of the Park Commissioners. The Act regulating the construction of fixtures for electrical conductors overhead contains the following words: "Except with such permission, no electrical conductors, poles or other fixtures or devices therefor, nor any wires, shall hereafter be continued, constructed, erected or maintained, or strung above ground in any part of said city." And again: "The said Board of Electrical Control may establish and from time to time may alter, add to or amend all proper and necessary rules, regulations and provisions for the manner of use and management of the electrical conductors." It occurs to the Committee that it would be well for the Board to ascertain the view of the Corporation Counsel as to the powers and duties of the Commissioners in regard to the electrical conductors in the public parks of the city, and as to whether these are under the control of this Board or exclusively under the control of the Commissioners of Parks.

All of which is very respectfully submitted.

JACOB HESS,

HENRY S. KEARNY, Committee on Lamp-posts.

In addition to the above, permits have been granted to the United States Illuminating Company to erect the lamp-post adopted by the Committee in the following streets:

New Chambers street, from Broadway to East River.
 Whitehall street, from Bowling Green to ferry.
 Liberty street, from Broadway to North River.
 Cortlandt street, from Broadway to North River.
 Barclay street, from Broadway to North River.
 And to the American Electric Manufacturing Company in the following streets:
 Boulevard, 110th to 155th streets.
 110th street, Boulevard to Sixth avenue.
 Sixth avenue, 110th to 136th streets.

JACOB HESS,

HENRY S. KEARNY, Committee on Lamp-posts.

APPENDIX B.

Rules and Regulations Governing the Occupancy of the Subways of the Consolidated Telegraph and Electrical Subway Company, Approved by Board, Dec. 22, 1887.

First. All applications for space in the subways to be made in writing, giving the name of the company, the number and length of conductors wanted, the purpose for which they are to be used; the size, number and length of the conductors to be placed in the same, whether singly or in cables, the kind, strength and quantity of current to be used, and such other specific information as will fully explain the use intended and method of such use. The application must also state the term for which conduits are wanted. All conductors to be used with a current of not exceeding _____ volts must have an insulation with a resistance of not less than _____ megohms per mile with an additional insulation resistance of _____ megohms for each additional _____ volts of current; and a guarantee satisfactory to the Subway Company must be given by the manufacturer of such conductors before they can be used.

Second. All conductors shall be placed in the subways by the lessee, unless otherwise mutually agreed upon. No company or its employees shall have access to the subways or to any manholes unless in the presence of an inspector of the Subway Company. All work in the manholes must be approved by and be satisfactory to the inspector of the Subway Company, who shall have authority to require such alterations as he may deem fit, for the safety of the cables or wires of other companies or the convenience of other companies. All repairs to conductors or cables must be made by the companies owning them immediately upon notice, and during such repairs all precautions necessary in the judgment of the Subway Company must be taken for the protection of other companies' wires.

Third. All alterations of or additions to the subways for the purpose of connecting wires therein with points outside will be made by the Subway Company upon the request of the company desiring the same, provided the same have been authorized by the Board of Electrical Control, and the expense of making such additions or alterations is satisfactorily guaranteed by the persons or companies desiring them.

Fourth. The Subway Company will not be responsible for any damage arising from any cause whatever to persons or property by reason of the conductors. It will use every reasonable precaution to prevent damage of any kind from any cause within its control.

Fifth. Rental to be paid yearly in advance. Applicants will be required to enter into a written contract with satisfactory guarantees for its performance.

Sixth. The Subway Company reserves to itself the right to add to or amend these rules and regulations from time to time as may be necessary, subject to the approval of the Board of Electrical Control.

Office of the Consolidated Telegraph and Electrical Subway Company, 18 Cortlandt street, New York.

The following additions have been suggested:

PARK BENJAMIN, PH.D.,
EXPERT COUNSEL IN PATENT MATTERS,
SOLICITOR BEFORE THE U. S. PATENT OFFICE,
NEW YORK, November 1, 1887.

THEO. MOSS, Esq., Secretary Board of Electrical Control:

SIR:—In compliance with the request of the Board of Electrical Control contained in its resolution of the 4th of October, wherein certain "rules and regulations governing the occupancy of the Subways of the Consolidated Telegraph and Electrical Subway Company" were referred to me, I have the honor to submit the enclosed rules for the consideration of the Board. I have taken the liberty of embodying such suggestions and alterations as I am able to present in this form, as one more concise and definite than if made in the shape of annotations to the original rules; but, at the same time, I have not altered any substantial provision of the latter, except in so far as the electrical questions involved rendered some modification apparently unavoidable.

I beg further to say that in reaching the conclusions here contained I have been greatly favored by the impartial counsel of Mr. Edward Weston, until recently the superintending electrician of one of the largest electric lighting corporations. Mr. Weston's experience in the matters here involved has been of the most extensive and practical character, and upon the results of his experiments, most kindly and fully placed at my disposal, I base such provisions as may appear arbitrarily fixed.

I am, sir, very respectfully yours,

PARK BENJAMIN.

Rules and Regulations Governing the Occupancy of the Subways of the Consolidated Telegraph and Electrical Subway Company.

I. All applications for space in the subways shall be made in writing and shall give

- (a) The name of the applicant.
- (b) The term for which the use of the conduit or conduits is wanted.
- (c) The number, material and dimensions of conductors proposed.
- (d) The arrangement of said conductors, whether singly or in cables, and if in cables the number of conductors and their disposition in each cable.
- (e) The maximum electro-motive force of the machine or machines supplying the current to be used.

(f) The nature of the insulating material or materials to be employed, and
(g) Such other specific information as will fully explain the use to be made of the space desired.

2. All applications for permits to make repairs or alterations in conductors in the subways shall be made in writing, and shall give

(a) The name of the applicant.

(b) A complete identification of the conductor or conductors referred to and of the particular conduit or conduits to which access is desired.

(c) Specific information as to the extent and character of the proposed repairs or alterations, and of the probable date when the same will be completed and the conductor or conductors restored to condition for use.

(d) The insulation resistance of the conductor or conductors as shown by the latest test, and the date of said test.

3. Whenever, in the judgment of the Subway Company, repairs or alterations in a conductor are necessary or desirable, said repairs or alterations shall be made by the party owning or controlling said conductor immediately upon notice. During the progress of any repairs or alterations upon or in a conductor the party owning the same shall take all precautions which the Subway Company may judge expedient to protect the conductors of other parties from injury or deterioration.

4. All conductors drawn into and operated in the conduit, and intended to convey currents of an electro-motive force exceeding fifty (50) volts, shall have an initial insulation resistance of not less than fifteen meg-ohms, per mile, per one hundred volts electro-motive force of current in the circuit. Whenever the insulation resistance of a conductor as aforesaid shall prove to be less than five (5) meg-ohms, per mile, per one hundred volts, the use of that conductor shall at once cease, unless the actual electro-motive force in its circuit be reduced so as to re-establish the foregoing ratio.

5. The insulation resistance per mile length of all branches and feeders of the main conductors shall at least equal that of the respective conductors to which said branches and feeders are connected.

6. The insulation resistance of each length of cable or conductor shall be determined before said length is laid in the subway. In making this determination an electro-motive force of current of not less than one hundred and fifty volts shall be employed, and the minimum initial resistance as provided in Rule 4 shall not be diminished through and after an immersion of the conductor under test of at least sixty consecutive hours. All lines shall be tested for insulation resistance immediately after completion in the subway, and daily thereafter for a period of one month and thereafter at least weekly. A conductor shall be tested for insulation immediately after any new connection with, addition or repair to, or alteration of any sort, in said conductor is made, and also whenever any other conductor is placed in the same tube; conductors conveying currents of less than fifty (50) volts electro motive force are excepted from this rule.

7. All tests and determinations called for by these rules shall be made by parties owning or controlling conductors. Duly authenticated records of the results of such tests and determinations within 24 hours after the completion of the same, shall be filed with the Subway Company, which shall have power to verify or repeat such tests or determinations in its discretion.

8. All conductors shall be placed in the subways by the lessees under the immediate supervision of a representative of the Subway Company. No person shall have access to the subways nor to any man-hole, nor shall work of any description be done in said subways or man-holes unless under the immediate personal supervision of

such representative. The Subway Company shall have authority to require such alterations in conductors as it may deem necessary for their safety or the safety of the subway or adjacent conductors; and also to cause the current in any conductor to be interrupted or reduced for such period of time as may be requisite in the judgment of said Company for the proper protection or necessary convenience of persons working in the man-holes or upon the subways in the vicinity of said conductor.

9. All alterations of or additions to the subways for the purpose of connecting conductors therein with points outside will be made by the Subway Company upon the request of the lessee desiring the same, provided the same have been authorized by the Board of Electrical Control, and the expense of making such additions or alterations is satisfactorily guaranteed by the parties desiring them.

10. Rental to be paid yearly in advance. Applicants will be required to enter into a written contract with satisfactory guarantees for its performance.

11. In no case will the Subway Company be responsible for any damage whatever to persons or property due to the existence or employment of the subways or the conductors therein or any apparatus connected therewith. The Subway Company will, however, use every reasonable precaution to prevent damage from any cause within its control.

12. The Subway Company reserves to itself the right to add to or amend these Rules from time to time as may in its judgment be necessary, subject to the approval of the Board of Electrical Control.

APPENDIX C.

Form of Notification to Operating Companies; as Approved by the Counsel to the Corporation.

"Whereas, In the opinion of this Board a sufficient construction of conduits or subways underground has been made ready, reference being had to the general direction and vicinity of the electrical conductors in use overhead in the following streets and localities of the city, to wit:

.....

 therefore be it

Resolved, That the Secretary be directed to notify the owners or operators of the electrical conductors above ground in such streets or localities, to make such electrical connections in said streets with such underground conduits or subways as may be necessary to the proper transaction of their business, and to place electrical conductors for the transaction of their business in the said conduits, and to remove poles, wires or other electrical conductors above ground and their supporting fixtures, or other devices, from the said streets and localities within ninety days after the receipt of this notice. And said companies are further notified to submit plans of said electrical connections hereby authorized, together with modifications of or additions to said conduits necessary, or deemed so to be, for making, the same, to this Board, within ten days, or as soon thereafter as possible, so that this Board may cause the said modifications or additions to be made, if they appear to be proper and necessary; and, in case the said suggestions for the modification of or additions to said conduits are not submitted to the Board, or do not appear to the Board to be proper and necessary, the following methods are designated by the Board for the making of the said electrical connections in the said streets: For electric light and power conductors,

subsidiary iron tubes from the nearest manhole in said subway, to the point desired to be reached and through said iron tubes insulated wires or cables, connecting the lights, machinery or termini of overhead lines with electrical conductors in the said conduits. For other service, subsidiary pipes or boxes either of wood or iron, extending from the nearest manhole to the point desired to be reached, with insulated conductors connecting the instruments or termini of overhead routes with the wires in the said conduits. The Consolidated Telegraph and Electrical Subway Company is authorized and directed to construct said subsidiary ducts or boxes, at such places as shall be desired by companies notified to use the subways as above, upon the application of such companies.

Commissioner Gibbens moved the adoption of the following resolution:

Resolved, That the report to the Governor and the Legislature be adopted and be made the report of the Board, and that the Secretary be authorized to have five hundred copies printed, and to send a copy to the Governor of the State and a copy to each member of the Legislature, and to furnish copies to such public officials and citizens as shall desire them.

Mayor Hewitt requested that the following statement be spread on the minutes previous to the adoption of the foregoing resolution:

"On Thursday, the 22d of December, the Board of Electrical Control passed a resolution requesting the Mayor to order the Commissioner of Public Works to remove certain poles and wires specified in the resolution.

"On the 25th of December the Mayor received a certified copy of this resolution from the Secretary of the Board of Electrical Control.

"On the 27th ultimo the Mayor transmitted the resolution thus received to the Commissioner of Public Works, and inquired whether, if the order should be given, there was any appropriation which could be applied to its execution.

"To-day (January 5) the Mayor is in receipt of a reply from the Commissioner of Public Works, informing him that no provision was made in the departmental estimate of that department for 1888, for the removal of such wires, poles and other fixtures, and that consequently no appropriation has been made to this department which could be applied to the execution of the order if given."

Mayor Hewitt said that he had brought this up before the adoption of the report in order that the Board might consider whether it is desirable to make any application for money for that purpose.

Commissioner Gibbens amended his report by inserting in it the words: "The Board is informed that no money has been provided by law to enable the local authorities to make these removals."

The report as thus amended was thereupon adopted by a unanimous vote.

JANUARY 6, 1888.]

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Commissioner Moss informed the Board that he had received from Mayor Hewitt that morning a communication in reference to the removal of poles and wires, and asked that the same be read and spread on the minutes, together with the statement already made by the Mayor. The Board so ordered.

The following is the communication :

MAYOR'S OFFICE,

NEW YORK, Jan. 5, 1888.

THEODORE MOSS, Esq., Secretary Board of Electrical Control,

1218 Broadway, City:

SIR:—On the receipt of your letter of the 24th of December, enclosing a copy of the resolutions of the Board of Electrical Control, requesting the Mayor to order the Commissioner of Public Works to remove certain wires, poles and other fixtures, I promptly transmitted the same to the Department of Public Works, asking whether if the order were given, there was any appropriation out of which the expense could be paid. I now enclose his reply received to-day by which it appears that no appropriation has been made to the Department which could be applied to the execution of the order if given.

Very respectfully,

ABRAM S. HEWITT, Mayor.

NEW YORK, Jan. 3, 1888.

HON. ABRAM S. HEWITT, Mayor:

SIR:—I duly received your letter of the 27th ultimo, enclosing a letter from the Secretary of the Board of Electrical Control, including a resolution that you be requested to order the removal by the Commissioner of Public Works, through the Bureau of Incumbrances, of certain wires, poles and other fixtures, which are therein enumerated, and stating that before you decide upon the propriety of issuing the order requested, you would like to be informed whether any appropriation has been made to this Department which could be applied to the execution of the order if given.

In reply I beg to inform you that no provision was made in the Departmental Estimate of this Department for 1888 for the removal of such wires, poles and other fixtures, and that consequently no appropriation has been made to this Department which could be applied to the execution of the order, if given.

Very respectfully,

JOHN NEWTON, Commissioner of Public Works.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday, January 20th, 1888, at 12 o'clock, noon.

Present: Mayor Abram S. Hewitt, Commissioner Jacob Hess, President; Commissioner Daniel C. Gibbens, Commissioner Theodore Moss.

The minutes of last meeting were read and approved.

The following opinion of the Corporation Counsel was read and ordered spread on the minutes:

LAW DEPARTMENT,
OFFICE OF THE COUNSEL TO THE CORPORATION.

NEW YORK, January 10th, 1888.

THEODORE MOSS, Secretary Board of Electrical Control:

SIR:—I am in receipt of your communication addressed to my predecessor and dated December 24th, 1887, transmitting a copy of a resolution adopted by the Board of Electrical Control, on December 22nd, as follows:

"Resolved, That the Report of the Committee on Lamp Posts be adopted by the Board, and that the Secretary inquire in the name of the Board of the Corporation Counsel, as to the duties of the Department of Public Parks in regard to the Electrical Conductors in the public parks of the city, and as to whether they are under the control of the Board or exclusively under the control of that department."

I am also in receipt of a copy of the reports referred to in the foregoing resolution, in which I find the following, which I suppose to have led to the adoption of the foregoing resolution:

"The Committee is informed that in certain parks of the city posts have been erected since the last meeting of the Board without permits from the Board of Electrical Control, but under permission of the Park Commissioners. The act regarding the construction of fixtures for the electrical conductors overhead contains the following words: 'Except with such permission no electrical conductor, poles, or other fixtures or devices therefor, nor any wires, shall hereafter be continued, constructed, erected or maintained, or strung above ground in any part of said city.' And again, 'the said Board of Electrical Control may establish and from time to time may alter, add to or amend all proper and necessary rules, regulations and provisions for the manner of use and management of electrical conductors.' It occurs to the committee that it would be well for the Board to ascertain the view of the Corporation Counsel as to the powers and duties of the Commissioners in regard to the electrical conductors in the public parks of the city, and as to whether these are under the control of this Board or exclusively under the control of the Commissioners of Parks."

It is true that section 4 of chapter 716 of the Laws of 1887, being the act under which your Board is organized, contains the provisions which is quoted in the report of your Committee on Lamp-posts, and if this provision stood by itself its language might be deemed to be broad enough to vest in your Board the sole power to grant permits for the erection of poles or other fixtures or devices for electrical conductors

in the public parks. The clause above quoted must, however, be read and considered with reference to other statutes and to other parts of the same statute, and being so read I think that it will be found that your exclusive jurisdiction to grant permits for the erection of poles, etc., does not extend to the public parks of the city.

Section 668 of the New York City Consolidation Act of 1882, provides that: "The Department of Public Parks shall control and manage all public parks," and section 691 of the same act provides that "The Department of Public Parks shall have exclusive authority to decide when and where any new lamps shall be put and lighted in the parks or places under its control." This last grant of power has never been expressly repealed and is to-day in full force, unless it has been superseded by the clause quoted in the report of your Committee on Lamp-posts. But before it can safely be held that an express grant of exclusive jurisdiction such as that contained in the section of the Consolidation Act last quoted has been repealed by a general grant of jurisdiction not, in terms, extending to the public parks, the intention of the Legislature to effect such a repeal must be made to appear very clearly. In my opinion such an intention does not appear. The first act providing for placing electric conductors under ground in this city is known as chapter 564 of the Laws of 1884, and it had reference exclusively to the streets, lanes and avenues of the city. Its first section provided that "all telegraph, telephonic and electric light wires and cables used in any incorporated city in this State having a population of five hundred thousand or over, shall hereafter be placed under the surface of the streets, lanes and avenues of said city," and the second section of the same act provided for the removal within a certain time of electric wires and poles providing that they should be removed from the surface of all streets or avenues in every such city of the State." The next act was chapter 499 of the Laws of 1885, which referred in terms to the act last above quoted, and the second section of which undertook to amend the act of 1884, so as to make it conform to the act of 1885. The duty of Commissioners to be appointed under this last mentioned act was declared to be, by the second section, "to cause to be removed from the surface and put, maintained and operated under ground wherever practicable, all electrical wires or cables used or to be used in the business of any such company in any street, avenue or other highway, in any such city, so as to enable and require all duly authorized companies operating or intending to operate electrical conductors in any street, avenue or highway of any such city, &c.;" and throughout the act of 1885, the words "street, avenue or other highway" are continuously used in such a way as to make it plain that what the Legislature had in mind and intended in adopting the act was to compel electrical conductors to be removed from the streets, avenues and highways of the city and to give the Board provided for by that act jurisdiction to compel such removal. The public parks of this city are neither a street, avenue nor a highway, and the act of 1885, therefore, clearly gave the Commissioners to be appointed under it no authority or jurisdiction to interfere with the exercise by the Park Commissioners of the powers vested in them by section 691 of the Consolidation Act.

The present act, under which your Board is now proceeding, known as chapter 716 of the Laws of 1887, confers upon and transfers to your Board all the powers and duties conferred by the act of 1885, upon the Commissioners appointed under it, and although in that act a somewhat broader phrase is used with reference to the place, in this city over which your Board has jurisdiction, I am of opinion that this act of 1887 must be read in conjunction with the act of 1885 and the prior act of 1884, and that it was not the intention of the Legislature in passing the act of 1887 to extend the jurisdiction of your Board as to the localities over which such jurisdiction should be

exercised, beyond the limits specified in the previous acts relating to the same question. The whole history of legislation in this State referring to the placing of electrical conductors under ground indicates an intention on the part of the Legislature to compel the removal of overhead wires from the streets, avenues and highways, but there is nothing in any act upon the subject which would justify a belief that the Legislature intended to extend the jurisdiction of your Board to the public parks of the city.

I am, therefore, of the opinion, that section 691 of the New York City Consolidation act is still in full force, and that it is lawful and competent for the Commissioners of Public Parks to authorize and provide for the erection of lamp posts and other appliances for the electric lights within the parks of the city, and that no permit for such erection is required from your Board.

Yours very respectfully,

HENRY R. BEEKMAN, Counsel to the Corporation.

A communication from W. H. Harding, Secretary and Treasurer of the National Electric Light Association, was read, requesting the Board's "expert to give his views in the matter of underground conduits," etc., to be read at a meeting of the Association, and the statement was made that the communication had been referred to the Engineer of the Board who had answered it.

The following communications from H. S. Huidekoper, Vice President of the Metropolitan Telegraph and Telephone Company, were read and ordered spread on the minutes:

OFFICE OF THE VICE PRESIDENT AND GENERAL MANAGER
OF THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.

18 Cortlandt Street, New York, Dec. 30, 1887.

Board of Electrical Control, THEODORE MOSS, Esq., 1218 Broadway, New York:

DEAR SIR:—Yours of the 28th inst has been received notifying us that conduits have been completed so as to make it possible to have wires removed from parts of seventeen streets specified in the letter, and I beg to say that this company has pole lines in the localities named only as follows:

- On Sixth avenue, from 9th street to 22d street.
- On Broadway, from Pearl street north to John street.
- On Spring street, from Broadway to South Fifth avenue.
- On 42d street, from Fifth avenue to Sixth avenue.
- On 45th street, from Vanderbilt place to Sixth avenue.

having no pole lines on any other of the twelve sections of streets.

In connection with this matter I beg also to inform you that this company is making every effort to place its wires underground and remove its poles from the routes where subways have been constructed, but is delayed by the difficulty in obtaining cables, and in many instances by reason of conduits not having been constructed from terminal points of sections which are described above, to points desired to be reached, so as to enable us to lay the body of our wires underground with as little inconvenience to our subscribers as possible, and within a reasonable limit of expense to us.

Some of the work which you require of us will, I regret to say, have to be postponed until spring, when additional conduits can be built, and in the meantime the cables which we can obtain will be used for the conduits in the lower part of the City, where they are required, and where their use will relieve the streets of heavy pole lines.

Referring to my letter to you of November 22d, I beg to advise you that the poles which this company had been is now using on Sixth avenue, between 22d and 58th streets, are the property of the Manhattan Telegraph Company, and that the said Manhattan Telegraph Co. was, on July 9th, advised of the instructions communicated to us in your letter of July 6th.

Trusting that the above will be satisfactory, and asking your indulgence in the matter of the delay, I am, Yours very respectfully,

H. S. HUIDEKOPER, Vice-Pres.

OFFICE OF THE VICE-PRESIDENT AND GENERAL MANAGER OF
THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.,

No. 18 Cortlandt Street.

NEW YORK, Jan. 18th, 1888.

Board of Electrical Control, 1218 Broadway, New York:

GENTLEMEN:—Referring to previous reports concerning the pole line on Sixth avenue, I beg to say that on Sixth avenue, between 21st and 51st street (with the exception of one pole immediately north of 21st street, which we use for distribution and cannot spare), we have now no wires on the poles on that street, having removed them all.

From 51st street to 58th street we are still using the poles, but will remove the wires from them as soon as possible.

Yours respectfully,

H. S. HUIDEKOPER, Vice-Prest. and Gen. Mangr.

The following communications from J. Elliot Smith, Superintendent Fire Department Telegraph, were read and ordered spread on the minutes:

HEADQUARTERS FIRE DEPARTMENT,

OFFICE SUPERINTENDENT OF TELEGRAPH,

Nos. 157 and 159 East 67th Street.

NEW YORK, December 22d, 1887.

COMMISSIONER GIBBENS, Board of Electrical Control, New York City:

DEAR SIR:—According to my calculations, we have wires distributed along Sixth avenue as per memorandum herewith, mostly on the East side; on the West side we have one or two wires only.

Very respectfully,

J. ELLIOT SMITH, Superintendent.

Fourth street to 8th street, 3 wires.
Eighth street to 10th street, 4 wires.
Tenth street to 12th street, 5 wires.
Twelfth street to 22d street, 3 wires.
Twenty-second street to 23d street, 2 wires.
Twenty-third street to 29th street, 3 wires.
Twenty-ninth street to 30th street, 7 wires.
Thirtieth street to 44th street, 4 wires.
Forty-fourth street to 51st street, 2 wires.
Fifty-first street to 58th street, 1 wire.

HON. JACOB HESS, President Board of Electrical Control,
No. 1218 Broadway, New York City:

DEAR SIR:—This department wishes to be informed as to the facilities which will be afforded for placing its wires in the Subway Conduits.

What rules, if any, have been adopted governing the use of manholes during the work, and access thereto from time to time for purposes of repair?

Are the conduits provided with drawing-in wires, or must the occupants provide such?

This department is prepared to proceed with the work, if the facilities offered are proper and sufficient to render it practicable.

We do not learn that any progress has been made towards providing the outlet branches which were asked for, without which, and the information herein asked, it is impossible to prepare necessary specifications, etc.

If you will kindly advise regarding the matter, you will greatly oblige.

Very respectfully,

J. ELLIOT SMITH, Superintendent.

Commissioner Gibbens stated, in respect to this last communication, that it had been referred by the Secretary to the Consolidated Telegraph and Electrical Subway Company, with a request that full information be furnished to the Fire Department.

Commissioner Gibbens stated that the Board had received from the United States Illuminating Company a long communication, "which, perhaps, the Board had as lief have stated as read. The substance of it is, that the United States Illuminating Company objects to that regulation of the Board of Electrical Control which provides for the use of poles, placed under permission of this Board, by other companies. The United States Illuminating Company believes that that regulation is beyond the powers of the Board. It is a legal point." He thereupon moved the following resolution:

Resolved, That the letter of the President of the United States Illuminating Company to the Board of Electrical Control, dated January 10th, 1888, be referred to the Corporation Counsel, with a request that he advise the Board as to whether any of the rules and regulations of the Board are improper for the Board to make

Adopted by a unanimous vote.

Commissioner Gibbens also stated that the Board had received other communications from the United States Illuminating Company, referring to the subject of their placing wires in the conduits, the latest one of which, addressed to Theodore Moss, Secretary, and dated January 13th, 1888, was read and ordered spread on the minutes.

The following is the communication:

THE UNITED STATES ILLUMINATING CO.,
Nos. 59 and 61 Liberty Street
NEW YORK, January 13th, 1888.

THEODORE MOSS, Esq., Sec'y, the Board of Electrical Control,
No. 1218 Broadway, New York:

DEAR SIR:—Your communication of the 28th ult. was duly received. As it relates to substantially the same streets and localities specified in the resolution of the Board adopted September 20th ult., and sent our company by you on September 21st, I would respectfully refer you to my letter of October 3d ult., and the correspondence which ensued between the Board and this company on its subject.

As it is evident from this correspondence, and from the fact that my letter of December 23d ult., to President Hess, remains unanswered, that the Board has decided what method must be pursued in distributing electric currents from the conduits now laid, and has also decided that the subsidiary iron tubes prescribed for such distribution must be constructed and laid by the Consolidated Telegraph and Electrical Subway Company, and not by the Company owning and operating the electrical conductors. I can only suggest that the Board should proceed to complete the subsidiary connections by which it is proposed to make the conduits available for use as an underground system.

I enclose a map showing the points of distribution and connections necessary, in the localities mentioned in your communication, to enable this Company to transact its business with its present customers.

Future connections may be required at any time with any house on the block.

Very respectfully yours,

EUGENE T. LYNCH, President.

Commissioner Gibbens offered the following resolution:

Resolved, That the Mayor be requested to order the removal, by the Commissioner of Public Works, through the Bureau of Incumbrances, of the following wires,

poles and other fixtures, the ninety days' notice required by law having expired without their being removed by the owners or operators thereof, to wit:

1. All the wires of the Metropolitan Telephone and Telegraph Company on poles on Sixth avenue, from 22d to 52d street.

2. All the poles of the Metropolitan Telephone and Telegraph Company, or lately used by the said Company, on Sixth avenue, from 22d to 52d streets (except such as may be required pending the placing under ground of the wires of the Fire and Police Departments).

3. All the poles and wires of the United States Illuminating Company on the north side of 25th street, between Sixth avenue and Broadway, being about 11 wires and 7 poles, the poles on corners of Broadway and Sixth avenue excepted.

4. All the poles of the Western Union Telegraph Company on Sixth avenue, from 22d to 58th streets (except such as may be required pending the placing underground of the wires of the Fire and Police Departments).

5. All the wires of the Western Union Telegraph Company on poles on Sixth avenue between 22d and 58th streets.

Adopted, Mayor Hewitt declining to vote, all others voting "aye."

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Tuesday, April 17th, 1888, at 12 o'clock, noon.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of last meeting were read.

Mayor Hewitt moved to amend the minutes by adding after the word "vote," on line six, page 11, of printed minutes, the words, "on the ground that it was not proper for the Mayor to vote on a request addressed to himself." The amendment was unanimously adopted, and the minutes, so corrected, were approved.

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MAYOR'S OFFICE,

NEW YORK, Jan. 26, 1888.

THEODORE MOSS, Esq., Secretary:

SIR:—On the receipt of your letter enclosing the resolution of the Board of Electrical Control, asking the Mayor to instruct the Commissioner of Public Works to remove certain poles and wires therein specified, I transmitted your letter to the Commissioner for his opinion as to whether he could execute such an order if it were issued by the Mayor. I now enclose you a copy of his reply, by which it appears that he is without funds which could be expended on the work indicated. It does not seem proper for me to issue an order which could not be executed. He suggests that the Board of Estimate and Apportionment might divert specific appropriations to objects other than those originally named; but he does not suggest which appropriation could in this way be diverted, and I have no information which will enable me to make any such suggestion. I am constrained, therefore, by the necessities of the position, to decline, as at present advised, to issue the order requested by the Board of Electrical Control.

Yours respectfully,

ABRAM S. HEWITT, Mayor.

NEW YORK, Jan. 25, 1888.

HON. ABRAM S. HEWITT, Mayor:

SIR:—I had intended to have referred the matter of the removal of the poles and wires of certain Electric Companies to the Corporation Counsel, but the provisions contained in Section 3, Chapter 716 of the Laws of 1887, are so explicit upon this subject that I consider it no longer necessary. The sole question, it appears to me, relates to the means provided for defraying the cost of these proceedings. As I have before reported to the Mayor, the removal of these poles and wires was not foreseen by this Department and was not made the subject of any Departmental Estimate for the year 1888; so that at present I am without funds for any such purpose. The Board of Estimate and Apportionment has, in several instances, diverted specific appropriations to objects other than those originally named.

Very respectfully,

JOHN NEWTON, Commissioner of Public Works.

The following communications, from the Consolidated Telegraph and Electrical Subway Company, were read:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL

SUBWAY CO., NO. 18 CORTLANDT STREET,

NEW YORK, April 17th, 1888.

To the Honorable, the Commissioners, of the Board of Electrical Control, New York City, N. Y.:

GENTLEMEN:—I herewith submit for your information the enclosed report relating to subway work completed in 1886 and 1887.

I am, very respectfully yours,

EDWARD LAUTERBACH, President.

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL

SUBWAY CO., NO. 18 CORTLANDT STREET,

[Copy.]

NEW YORK, April 17th, 1888.

EDW. LAUTERBACH, Esq., President Consolidated Telegraph and Electrical Subway Company, 18 Cortlandt Street, New York City, N. Y.:

DEAR SIR:—I submit herewith the complete returns and measurements of the subways laid in 1886 and 1887, with such data as may be useful for record.

The maps showing the work in the above years are completed and submitted herewith. They afford the necessary data for locating the subways and connections, and for obtaining the required lengths of the electrical conductors and cables that the companies propose to place therein.

Your attention is called to the following statements:

First.—Work executed in 1886.

The subways built in 1886 were entirely on the "Dorsett" system of coal tar concrete, laid in a single line on Sixth avenue, from 21st to 58th street, containing 24 ducts, $2\frac{1}{2}$ inches in diameter.

TABLE, 1886.

	Length of Trench.	Length of Single Duct.
Telephone and Telegraph.....	9,825.73 feet	235,817.52 feet
	1.88 miles	44.66 miles

There are 42 manholes on this line with square heads. Experience shows that these manholes are not large enough inside, and this has been corrected in new work.

The subsidiary or distributing work done in 1886 was limited to a dozen short connections put in by the fire department, at their own expense, at different points on the avenue to afford outlets to fire alarm boxes on poles, etc. These connections are made by short pieces of pipe let through the side walls of the manhole and capped on the outside until the connections are completed for use.

Second.—Work executed in 1887.

The subways built in 1887 were built according to several different systems, partly on account of the difficulty of obtaining sufficient supplies of any one kind of material to meet the large and pressing demands on the company to lay the subways and make up the time which was lost by preliminary delays, and partly to afford the opportunity of obtaining results electrically on approved systems of construction, which had shown qualities of durability and strength elsewhere. The important consideration being kept in view that the streets of New York had best not be used for experiments in construction.

The different kinds used were as follows:

	FEET
Iron pipe, laid in hydraulic cement concrete.....	866,317.65
“ “ asphaltic “ “	35,423.70
Cement pipe laid in hydraulic cement concrete.....	156,613.04
Zinc tubes, laid in hydraulic cement concrete.....	68,882.55
Creosoted tubes.....	71,781.92
Total.....	1,199,018.86

The subways as laid were divided as follows, the principal having been established of separating telephone and telegraph subways from high tension electric light subways by building them on opposite sides of the street:

	Length of trench.	Length of Single Duct.
Telephone and Telegraph Subways.....	46,532.86 feet	952,335.56
Electric Light Subways.....	28,387.55 “	246,683.30
Total	74,920.41 feet	1,199,018.86

Besides the above, the Edison incandescent light system, with iron pipes, was laid, partly in subway trenches and partly in special trenches, as follows:

	Length of Trench.	Length of Single Duct.
Edison in Subway Trenches.....	43,624	95,042.00
“ in Special Trenches.....	56,441	114,324.00
Total	102,065	209,366.00

It is necessary to state that in the Edison work their returns do not entirely agree with our measurements.

The total subways built in 1887 can be summarized as follows:

	Length of Trench.	Length of Single Duct.
Telephone and Telegraph.....	46,532.86	952,335.56
Electric Light.....	28,387.55	246,683.30
Edison, Subway Trench.....	.....	95,042.00
Edison Special Trench.....	58,441.00	114,324.00
Total.....	133,361.41 ft.	1,408,384.86 ft.
	25.25 miles	266.72 miles

The total number of manholes built in 1887 is 279, viz.: 83 square heads and 196 round ones. The square head street frames proving objectionable in some respects, an improved round top frame has been designed, with double covers, and has been adopted throughout the city. This standard is now being followed in several cities.

A number of distributing ducts and connections have been laid in 1887; the materials used have been iron pipe and creosoted wood, amounting in all to 857 feet of trench and 7,189 feet of single duct.

The total subway work executed in 1887, inclusive of distributing or subsidiary ducts is:

	Length of Trench, Ft.	Length of Single Duct, Ft.
Subways	133,361.41	1,408,384.86
Distributing Ducts	857.00	7,189.00
Grand Total.....	134,218.41	1,415,573.86
	25.41 miles	268.11 miles

Third.—The summary of work executed up to January 1st, 1888, is as follows:

	Length of Trench.	Length of Single Duct.	Manholes.
In 1886.....	1.88 miles	44.66 miles	42
In 1887.....	25.41 "	268.11 "	279
Total.....	27.29 miles	312.77 miles	321

It is difficult to estimate accurately the capacity in mileage of electrical conductors which the above system furnishes, but on the basis of 100 of 100 telephone wires to a duct of the standard size of $2\frac{1}{2}$ inches, inside diameter, the probable maximum capacity would then be for 31,277 miles of wire.

The statements submitted will probably give whatever information in detail that may further be required.

All of which is respectfully submitted.

I am, very respectfully yours,

(Signed) LEONARD F. BECKWITH, Chief Engineer.

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL

SUBWAY CO., No. 18 CORTLANDT STREET,

New York, April 17th, 1888.

To the Honorable, the Commissioners of the Board of Electrical Control, New York City, N. Y.:

GENTLEMEN:—We beg leave to submit the following statements and map, showing the balance of the subway work authorized by your Board in 1887, and remaining yet to be built.

We desire also to ask for the authorization of the subway lines described in this communication, and shown also on the above mentioned map.

The unfinished work is as follows:

TELEPHONE AND TELEGRAPH SUBWAYS.

LOCATION.	SIDE.	PERMITS.	APPROXIMATE LENGTH OF	
			SINGLE DUCT.	
Whitehall St., Pearl to Water.....	E.	Permit Issued.	350 feet	
Stone St., Whitehall to Broad.....	S.	" "	15,960 "	
Broad St., So. William to Water.....	E.	" "	4,140 "	
Spring St., So. 5th Ave. to West.....	S.	" "	26,000 "	
" " Broadway to Crosby.....	S.	" "	5,000 "	
Houston St., Hancock to 2d Ave.....	S.	" "	38,160 "	
Grand St., Crosby to Chrystie.....	S.	" "	22,800 "	
So. 5th Ave. Spring to W. 4th St.....	S.	" "	51,260 "	
W. 4th St., So. 5th Ave. to 6th Ave.....	S.	" "	25,200 "	
6th Ave., 4th to 9th Sts.....	W.	" "	21,000 "	
Broadway, 14th to 15th Sts.....	E.	" "	7,800 "	
Madison Ave., 40th to 45th Sts.....	W.	" "	11,825 "	
" " 45th to 59th Sts.....	W.	None.	30,580 "	
Broadway, 44th to 45th Sts.....	E.	Permit Issued.	2,500 "	
" " 45th to 52d Sts.....	E.	" "	18,500 "	
" " 55th to 59th Sts.....	E.	" "	15,000 "	
8th Ave., 45th to 50th Sts.....	W.	Permit Issued.	9,500 feet.	
6th Ave., 56th to 59th Sts.....	W.	" "	4,500 "	
18th St., 6th to 7th Aves.....	S.	" "	10,800 "	
18th St., Broadway to 1st Ave.....	N.	" "	39,650 "	
34th St., 5th to Madison Aves.....	N.	" "	1,500 "	
39th St., 8th Ave. to Broadway.....	N.	None.	41,850 "	
38th St., 4th to Lexington Aves.....	N.	" "	15,080 "	
40th St., 5th to Madison Aves.....	N.	Permit Issued.	750 "	
42d St., 5th to Madison Aves.....	S.	" "	1,500 "	
45th St., 6th to 8th Aves.....	S.	" "	10,800 "	
53d St., 6th to Madison Aves.....	S.	None.	5,600 "	
53d St., 6th to 8th Aves.....	N.	Permit Issued.	7,600 "	
			445,205 feet.	

ELECTRIC LIGHT SUBWAYS.

6th Ave., 50th to 59th Streets.....	W.	Permit Issued.	14,580 feet.
7th Ave., 45th to 58th Streets.....	E.	None.	21,000 "
8th Ave., 45th to 59th Streets.....	E.	Permit Issued.	35,000 "
Broadway, 45th to 59th Streets.....	W.	" "	36,000 "
56th Street, Madison to 8th Aves.....	N.	None.	12,800 "
			119,380 feet.

EDISON SUBWAYS—SPECIAL TRENCH.

LOCATION.	SIDE.	APPROXIMATE LENGTH OF	
		PERMITS.	SINGLE DUCT.
Madison Ave., 49th to 51st Streets.....	E.	None.	1,000 feet
" " 53d to 56th "	E.	"	2,000 "
" " 57th to 59th "	E.	"	1,000 "
6th Ave., 32d to 34th Streets.....	E.	Permit Issued	1,000 "
6th Ave., 40th to 45th "	E.	" "	2,150 "
6th Ave., 45th to 50th "	E.	" "	1,400 "
7th Ave., 51st to 58th "	W.	None.	1,900 "
25th Street, Broadway to 6th Ave.....	S.	Permit Issued.	1,800 "
26th " 5th to Madison Ave.....	N.	" "	500 "
27th " " "	N.	" "	500 "
28th " Broadway to Madison Ave.....	S.	" "	800 "
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28th Street, 5th to Madison Ave.....	N.	Permit Issued.	14,050 feet.
29th " " to " "	both	" "	500 "
30th " " to " "	"	" "	500 "
31st " " to " "	"	" "	500 "
32d " " to " "	"	" "	500 "
33d " " to " "	"	" "	500 "
34th " " to " "	S.	" "	500 "
35th " " to " "	S.	" "	500 "
36th " 100, bet. Lex. & 3d Aves.....	N.	" "	100 "
36th " Broadway to 6th Ave	N.	" "	200 "
37th " 5th to 4th Avenues.....	N.	" "	2,700 "
39th " 5th to Madison Aves.....	both	" "	4,000 "
43d " 6th to " "	S.	None.	1,400 "
43d " 5th to " "	N.	"	500 "
44th " 6th to 5th "	N.	"	900 "
44th " 5th to Madison "	S.	"	500 "
45th " 5th to 6th "	N.	Permit Issued.	900 "
46th " 5th to 6th "	N.	None.	3,000 "
48th " 5th to Madison "	S.	"	500 "
48th " 5th to 6th "	N.	"	2,000 "
49th " 5th to 8th "	N.	"	5,600 "
50th " 6th to 5th "	S.	Permit Issued.	2,000 "
51st " 7th to Madison "	S.	None.	4,800 "
51st " 6th to 5th "	N.	"	2,000 "
54th " 5th to 6th "	N.	"	2,000 "
55th " Broadway to 8th "	N.	"	1,000 "
55th " 5th to 6th "	N.	"	2,000 "
56th " 5th to 6th "	S.	"	2,000 "
58th " 5th to 6th "	S.	"	2,000 "
58th " 5th to 6th "	N.	"	2,000 "
59th St., 6th to 5th Aves, half way	S.	Permit Issued.	1,000 "

61,050 feet.

SUMMARY OF WORK AUTHORIZED.

Telephone and telegraph subways.....	445,205
Electric light subways.....	119,380
Edison subways, special trench.....	61,650
“ “ common trench.....	

Total length of single duct, exclusive of Edison ducts in sub-trenches.....	626,235
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The above amount of 625,735 feet, or 118 miles, that remain to be built, is nearly 50 per cent. of the total length of duct laid during the year 1887. It covers the completion of the trunk line on Sixth avenue and South Fifth avenue, connecting the up-town and down-town districts, the completion of the Broadway lines up to Central Park, the sections on Eighth, Seventh and Madison avenues, and the two cross-town lines, besides a few scattering pieces and the Edison work. The execution of the above work will, if prosecuted continuously, take from three to four months to complete, and the greater part is necessary to connect the sections already completed, in order that the Company may fully avail of them for rental. An examination of the statement will show that no portion can well be postponed except the electric light line on Seventh avenue—about 21,000 feet of duct.

In laying out new lines, it is important also to bear in mind that the electric light subways, exclusive of Edison ducts completed in 1887, amount to 246,683 feet, and the amount to be completed is 119,380, or 366,083 feet in all. The Electric Light Companies have not yet occupied any of the above. Until they have done so, and discovered by actual test that they satisfy their requirements, of which there is, however, no reasonable doubt on our part, it would be unwise to build more electric-light ducts. One exception should, however, be made, and that is for the building of such electric-light subways as may be strictly necessary to connect the present system with existing or proposed central stations of lessees of the subways.

The new lines that are necessary, and which we recommend to your Board for your authorization, are as follows:

First.—A number of short subways in the lower part of the city, giving telephone and telegraph accommodation where it is greatly needed. This includes the connection of Frankfort street, between the existing systems and the anchorage of the Brooklyn Bridge, which is absolutely necessary. The total amount of this work, is, approximately, 108,470 feet. For this work I would recommend the use of iron pipe laid in hydraulic cement concrete, as the most permanent and suitable construction.

NEW WORK TO BE AUTHORIZED—TELEPHONE AND TELEGRAPH SUBWAYS.

TABLE A.

	Feet.
Hanover Square, Hanover to William street.....	1,470
Pearl street, Hanover to Wall.....	1,875
Front street, Gouverneur Lane to Old Slip.....	825
Old Slip, Front to Water.....	1,000
“ “ Water to Pearl.....	1,260
“ “ Pearl to Stone.....	1,200

	Feet.
South William, Exchange Place to Beaver.....	1,160
William, Beaver to Stone.....	680
Front, Pine to Maiden Lane.....	1,140
Maiden Lane, Front to Pearl.....	2,250
Maiden Lane, Pearl to William.....	4,680
Maiden Lane, William to Nassau.....	8,160
“ “ Nassau to Broadway.....	11,200
Pearl street, Wall to Maiden Lane.....	2,800
“ “ Maiden Lane to John.....	2,040
“ “ John to Fulton.....	4,440
“ “ Fulton to Beekman.....	3,575
“ “ Beekman to Dover.....	5,840
William street, Pine to Maiden Lane.....	3,360
Nassau street, Pine to Cedar.....	1,050
“ “ Cedar to Liberty.....	2,240
“ “ Liberty to Maiden Lane.....	1,925
Frankfort, Park Row to Pearl.....	33,800
Cortlandt, New Church to North River.....	10,500
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	108,470

Second.—The completion of the Trunk Line for telephone and telegraph purposes in Broadway, between 14th street and Vesey street, requiring an approximate length of single duct of 306,570 feet, as shown in detail in Table B.

TABLE B.

	Feet.
Broadway, Park to Murray street.....	24,000
“ Murray to Chambers street.....	19,600
“ Chambers to Franklin street.....	43,500
“ Franklin to Canal street.....	22,000
“ Canal to Grand street.....	14,950
“ Grand to Spring street.....	35,100
“ Spring to Houston street.....	44,100
“ Houston to 4th street.....	32,500
“ 4th street to Clinton place.....	23,000
“ Clinton place to 10th street.....	10,420
“ 10th to 14th street.....	27,500
“ 14th to University place.....	7,800
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	414,940

We recommend iron pipe laid in hydraulic cement concrete for this important line, which should be of the most permanent character.

Third.—The necessities of the City Fire Department require that in order to avail of the subways, connection be given them to their headquarters by a line running north from 58th street subway, seven blocks to 65th street. Ultimately a trunk line to connect the Harlem districts with the rest of the City will be necessary on Lexington avenue or some adjacent avenue, and it is recommended that at present a section of the above to be built as far as 65th street, requiring an approximate length of 50,000 feet of single duct.

For this work we recommend that discretion be left to the Engineer to apply for iron pipe laid in hydraulic cement concrete, iron and cement pipe, or creosoted wood construction, etc., as further examination may develop to be most desirable.

Fourth.—The proposed establishment of electric light stations on or near the North River about 23d street, render necessary an electric light subway on West 23d street, from a point near the North River and extending as far east as Sixth avenue, and possibly Broadway. This will require about a length of from 130,000 to 150,000 feet of single duct, and will give the required facilities to the Safety Electric Light and Power Company, the Harlem Electric Light Company, and others. We recommend that this line be applied for to be built of iron pipe laid in hydraulic cement concrete, or of iron and cement pipe laid in hydraulic cement concrete, in the discretion of the Engineer, the preference of the electric light companies who propose to use the ducts being considered.

The total length of the above lines now recommended amount to about 615,000 feet of single duct, which, added to the balance of 625,735 feet of unfinished work, make 1,240,735 feet in all, or about the same total completed in 1887. With the length of Edison ducts that will probably be laid in subway trenches, the above will be all that can reasonably be expected to be built this year, and it is desirable with regard to next year's work to remain without any lines carried over and to be left free to build what is more pressing when the time comes.

With regard to the building of the lines, we recommend the following as the order of the execution of the work:

- 1st. The completion of the Sixth Avenue and South Fifth Avenue Trunk Line, for which we have all the material on hand.
- 2d. The completion of the up-town Broadway, Eighth and Sixth avenue lines.
- 3d. The Broadway Trunk Line, from Fourteenth to Vesey street.
- 4th. The Frankfort Street Branch and other short sections down town.
- 5th. The Lexington avenue line.
- 6th. The 23d Street Electric Light line.
- 7th. The Spring street system and remaining portions, as the different sections above are completed in turn.

Undoubtedly, several of the above sections will be prosecuted simultaneously and independently.

There will probably be a considerable amount of distribution and subsidiary ducts applied for during the present season, and, where possible and available, the users of the ducts should be encouraged to apply in time for these facilities on the streets on which subways are being built, in order that distributing ducts be laid where practicable in the subway trenches to serve the buildings on these streets.

All of which is respectfully submitted for your consideration and the action of the Board.

I am, very respectfully yours,

EDWARD LAUTERBACH, President.

After discussion Commissioner Gibbens offered the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be directed to proceed, during the first week in May, to complete the work authorized last year by the Board, and that the recommendations made by that Company in regard to new work be referred to the Engineer, who will report thereon to the Board at the next meeting.

Adopted; all voting "aye."

The Board ordered the following communications spread on the minutes:

LAW DEPARTMENT,

OFFICE OF THE COUNSEL TO THE CORPORATION,

NEW YORK, February 18th, 1888

HON. THEODORE MOSS, Secretary, Board of Electrical Control:

SIR:—I am in receipt of your communication of the 24th ult., transmitting a copy of a letter addressed to your Board by the President of the United States Illuminating Company, dated January 10, 1888, and a copy of the rules and regulations of your Board, and advising me of the adoption of a resolution by your Board referring said letter to me with the request for my advice, "whether any of the said rules and regulations of the Board are improper for the Board to make."

The only portion of the letter in question which criticises any of the rules and regulations referred to, is found in the reference to a permit granted by the Board of Electrical Control to the United States Illuminating Company to erect lamp-posts in certain streets of the City. The writer says: "The permission thus given, as I am informed, coupled with a proviso that it shall be used subject to all the rules of the Board, one of which is to the effect that the Company shall allow any other Company to use, for the support of its wires, the posts erected under said permission, and shall accept the rule as creating a contract for such use with such other company."

"I am advised by counsel that my company ought not directly or by implication to involve itself in such a contract."

The rule, which is this, made the subject of comment, reads as follows:

"XI. The companies or persons owning or controlling poles in any street or avenue, shall allow the same to be used by other companies or persons operating conductors for similar electrical service, when authorized so to do by the Board on tender of proper compensation to be determined by agreement between the companies or persons interested. In default of such agreement, the amount of such compensation shall be determined by the Board. This rule imports a contract on the part of each company or person owning or controlling the poles in any street or avenue, not only with the Board, but also with each company or person who shall under its terms be qualified to demand the privileges it confers."

The right of the United States Illuminating Company to carry on the business of electric lighting in this City is predicated upon the consent of the Common Council granted in pursuance of the provisions of Chapter 512 of the Laws of 1879, as amended by Chapter 73 of the Laws of 1882.

Section 2 of the statute last mentioned, provides that "Any such company described in the first section hereof, shall have full power to carry on the business of lighting, by electricity, cities, towns and villages within this State and the streets, avenues, public parks and places thereof, and public and private dwellings therein; and for the purposes of such business to generate and supply electricity * * * * ; and shall also have power to lay, erect and construct suitable wires or other conductors with the necessary poles * * * * in, on, over and under the streets, avenues, public parks and places of such cities, towns or villages * * * * with the consent of the municipal authorities thereof, and under such reasonable regulations as they may prescribe."

From this it will be observed that the exercise of the privileges which might be obtained by any corporation under this law was intended by the Legislature to be subject to a broad qualification subordinating the rights of such corporation to a regulating power in the interests of the public, and making the private right secondary in importance to the public convenience in the use and enjoyment of the streets and highways.

Section 1, of Chapter 716, of the Laws of 1887, under which your Board is organized, provides among other things that

"* * * * all the powers and duties heretofore by any law conferred or imposed upon the local authorities of said city (New York) or any of them in respect to or affecting the placing, erecting, construction, suspension, maintenance, use, regulation or control of electrical conductors or conduits or subways for electrical conductors in said city are hereby transferred to and conferred and imposed upon, and shall hereafter be exclusively exercised and performed by the said Board of Electrical Control, constituted as provided in this Act, and its successors as hereinafter provided."

Under this provision of the Act, the powers conferred upon the Common Council by Chapter 512, of the Laws of 1879, became vested in your Board and with them the right to regulate the use of the streets by all electric lighting companies to the extent possessed by the Common Council under the Act of 1879 above mentioned.

In addition to this, Section 4, of the Act of 1887, prohibits the erecting of poles and stringing of wires within the city without the permission of your Board, and authorizes said Board to establish, and from time to time to alter, add to and amend "all proper and necessary rules, regulations and provisions for the manner of use and management of the electrical conductors, and of the conduits or subways therefor constructed or contemplated under the provision of this Act or of any Act herein mentioned."

There can therefore be no doubt of the power of your Board to regulate the manner of exercise of the business placed under your control and supervision by the Legislature, and that you may adopt and require the observance of such rules and regulations upon the subject as may be reasonable and pertinent to the purposes and intent of the statutes under which your jurisdiction is established.

It is difficult to lay down a rule which shall in all cases afford an easy test of the reasonableness of a regulation affecting a private right under a delegation of legislative power to a local body to make regulations.

Stated generally, a regulation of such description must be:

1st. In harmony with the general intention of the Legislature in reference to the subject matter upon which it has acted, and in respect of which the right to regulate has been delegated.

2d. Commensurate in the importance of the public purpose to be served, with the burden which it imposes upon the private right.

3d. While it may hamper or impair the right to be regulated, it may not destroy it.

Applying this test, I fail to perceive in what respect the rule in question can be considered at all unreasonable.

The general intent of the Legislature, manifested in the various statutes passed on the subject of electrical conductors, undoubtedly is that the wires shall be placed underground and the poles removed from the streets of the city. The exception in the Act which empowers your Board to permit further poles and wires to be erected, read in connection with other provisions of the law, unmistakably indicates a policy of temporary toleration of an evil for which a remedy is in course of preparation. In making this increase in poles and wires subject to the permission of your Board, coupled with your general powers of regulation, it was intended that as far as might be the resulting inconvenience to the public should be reduced to a minimum.

A regulation then which proposes that instead of two poles there shall be one, is most important in its relation to the object of the law and the interests of the public—and as the single pole is adapted to carry the wires of more than one company without serious or any impairment of the operations of either, it is difficult to see what objection worthy of consideration can be urged to the fairness of the regulation in question, especially as suitable provision is made for a proper money compensation to the company owning the pole for its use by the other.

It must not be lost sight of that all uses of the streets and highways for private gain are tolerated out of consideration solely for the convenience and advantage which the people enjoy as purchasers of that which such use is intended to supply.

The streets belong to the public and, except as the Legislature shall explicitly otherwise provide, may not be used for any other than purposes which are strictly public and whatever private right may be granted in them must always be subject to regulation in the public interest.

This doctrine is substantially laid down in a recent case in the Court of Appeals not yet reported.

The People ex rel The N. Y. Electric Lines Co., vs. Squire.

The Court there states as follows:

"These statutes were obviously intended to restrain and control as far as practicable, the evils alluded to by requiring all such wires to be placed underground in such cities and be subject to the control and supervision of local officers who could reconcile and harmonize the claims of conflicting companies, and obviate, in some degree, the evils which had grown to be almost, if not quite, intolerable to the public. The scheme of these statutes was not to annul or destroy the contract rights of such companies, but to regulate and control their exercise. They did not purport to deny them any privileges theretofore granted, but they did require that they should be exercised with due regard to the claims of others, and in such a way that they should cease to constitute a public nuisance, and should be enjoyed in such a manner as to inconvenience and endanger the general public as little as possible."

"That regulations of the character provided for in these acts are strictly police regulations, and such as no chartered rights can nullify or override, is too clear to admit of dispute. The primary and fundamental object of all public highways is to furnish a passageway for travelers in vehicles, or on foot, through the country (Bouvier's Institutes, Sec.)— They were originally designed for the use of travelers alone, but in the course of time, and in the interest of the general prosperity and comfort of the public they have been put, especially in large cities, to numerous other uses, but such cases have always been held to be subordinate to the original design and use. Thus they have been appropriated, in recent times, for the erection of sewers, water pipes, gas pipes, pipes for heating and manufacturing purposes, underground railroads, trenches for wires for telegraph, telephone and other purposes, which all require in their construction the disruption of the pavements and the temporary interruption at least of the right of travelers in the public highways. The due and orderly arrangement of the various and conflicting claims to privileges in the streets of large cities would seem imperatively to require the creation of a neutral board with controlling authority to form a comprehensive plan by which these various enterprises might be harmonized and carried on without detriment to each other, and with due regard to the rights of the public. Such power is pre-eminently a police power, and it is within the legitimate authority of a legislature to delegate its exercise to municipal corporations."

* * * * *

"The right to exercise this power cannot be alienated, surrendered or abridged by the Legislature by any grant, contract or delegation whatsoever, because it constitutes the exercise of a governmental function without which it would become powerless to protect those rights which it was especially designed to accomplish."

I am, therefore, of the opinion, and advise you that the regulation in question is a reasonable one, and within the power of the Board to make in the granting of permits for the erection of poles.

As to the other rules and regulations, while they seem to be reasonable upon their face, it is proper that I should reserve any official expression of opinion upon them until they are questioned under a state of facts showing the nature of their operation.

Yours respectfully,

HENRY H. BEEKMAN, Counsel to the Corporation.

STATE OF NEW YORK,

OFFICE OF CIVIL SERVICE COMMISSION,

ALBANY, March 21, 1888.

To the Board of Electrical Control, New York City:

GENTLEMEN:—I have the honor to transmit to you herewith a copy of an opinion given by the Attorney-General of this State in response to a resolution adopted by this Commission.

As the Attorney-General decides that you are State and not Municipal officers, the subordinates hereafter appointed by you will be subject to the Rules and Regulations for the State Civil Service.

[APRIL 17, 1888.]

With a view to a proper classification, the Commission would be obliged for a statement of the names, dates of appointments, titles of positions and salaries of all persons in your employ and also of the nature of the duties required of such persons as you may hereafter desire to appoint.

Very respectfully yours,

CLARENCE B. ANGLE, Secretary.

STATE OF NEW YORK,

OFFICE OF THE ATTORNEY GENERAL,

ALBANY, March 14, 1888.

CLARENCE B. ANGLE, Esq., Secretary Civil Service Commission, Albany, New York:

DEAR SIR:—I am in receipt of the resolution passed by the Board of Civil Commissioners, of which the following is a copy, viz.:

Resolved, That this Board having received a communication under date of March 1st instant, from Henry E. Barton, an applicant who asks to be examined for the position of clerk in the office of the Board of Electrical Control, and this Board having some doubts as to the jurisdiction in the matter, the opinion of the Attorney-General is respectfully requested as to whether the Board of Electrical Control are State or municipal officers.

In reply thereto I beg leave to submit the following:

The line of distinction between State and municipal, county or local officers has never been clearly drawn and well defined, and as the question has generally only incidentally arisen in most of the cases where it has been discussed by the Courts, there appears to be no settled rule or principle upon which to base a conclusion; indeed it may be stated, I think, that each case as it arises will depend upon its own particular facts and circumstances.

It will be necessary, therefore, to examine the statute creating the office in reference to its general scope and application, the object sought to be obtained, and all its incidents and intendments, in order to apply thereto what scraps of general principle may be found, before we can arrive at anything like a satisfactory conclusion.

The first act upon the subject was Chapter 534 of the Laws of 1884, which is entitled "An Act in relation to telegraph and electric light companies in the cities of this State."

It provides that all telegraph, telephone and electric light wires and cables used in any incorporated city of the State, having a population of five thousand, shall hereafter be placed upon the surface of the streets, lanes and avenues of said city. Every corporation or person owning or controlling such wires was directed to have the same removed from the streets and placed under ground on or before the first of November, 1885.

In the event of the failure of the owners to remove said wires, the city authorities were directed to remove them without delay.

The cities were forbidden to grant any exclusive privilege or franchise under the Act to any corporation or individual by which a monopoly might be created or competition prevented on equal terms.

This was a general and not a local act. A law relating to particular persons or things as a class is general, while one relating to particular persons or things of a class is local. This act relates to a class as a whole, and not to any particular elements of such class. The class consists of every city in the State having a population of over five hundred, and under the authority of the "Matter of the Application of Church," 92 N. Y., 1, is not a local but a general Act. We have, therefore, a general act directing a general public improvement in cities within the State.

The next act upon the subject was Chapter 499 of the Laws of 1885, entitled "An Act providing for placing electrical conductors under ground in cities of this State, and for Commissioners of electrical subways."

Section one provides that "Within twenty days after the passage of this Act, in any city of this State having, according to the last census, a population exceeding five hundred thousand and less than one million, the Mayor of such city is hereby authorized and directed to appoint, and cities having a population exceeding one million the Mayor, Comptroller and Commissioner of Public Works of such cities are hereby authorized and directed to appoint three disinterested persons, resident of the respective cities for which they shall be appointed, to be a board of commissioners of electrical subways. Such board shall meet as soon as practicable after such appointment * * * * *"

Section 2. "The said board of commissioners is hereby charged with the responsibility of enforcing the provisions of an Act entitled, 'An Act in relation to telegraph and electric light companies in cities of this State,' passed June 14th, 1884, as amended (the Act first hereinbefore referred to); and the said Act is hereby amended and made to conform in all respects to the provisions of this Act, and it is hereby made the duty of the board of commissioners to cause to be removed from the surface and put, maintained and operated under ground, wherever practicable, all electrical wires or cables used or to be used in the business of any such company in any street, avenue or other highway in any such city, so as to enable and require all duly authorized companies, operating or intending to operate electrical conductors in any street, avenue or highway of any such city as is or shall be effected by the provisions of said act, to transact their business with underground conductors wherever practicable."

Section 3 provides for the filing of maps, &c.

Section 4 makes it the duty of the board to investigate the methods, &c., proposed, and authorizes them to grant applications in certain cases for leave to let the wires remain above ground in the suburbs of the cities, and declares the policy of the act to be to convert the "overhead systems of electrical wires and cables now in use in said cities to underground systems as soon as possible."

Section 5 directs the course to be pursued by the Commissioners in granting permits for aerial lines.

Section 6 provides for the term of office of the Commissioner, and that they may be removed by the Governor upon an opportunity of being heard.

Section 7, as amended by Chapter 503, Laws of 1886, provides that the salaries of each of the Commissioners, in cities of more than one million of inhabitants, shall be five thousand dollars a year, payable quarterly by the Comptroller of this State, who shall audit and pay quarterly all necessary and incidental expenses of each of such Boards of Commissioners. The amount of said salaries and expenses to be collected by said Comptroller from the different companies owning and using wires, &c., in said cities.

Section 8, as amended by said act of 1886, makes it the duty of the different companies to furnish the Comptroller with proper figures, data, &c., upon which to base a calculation and determine the proportion and just amount of such salaries and expenses that should be paid by said companies.

Section 9 requires all maps, books, papers, &c., of the Commissioners, relative to the electrical conductors, to be filed in the office of the Mayor.

The next and last act upon the subject is Chapter 716 of the Laws of 1887, which adds the Mayor for the time being to such Commission, and continues its existence; provides for the removal of the Commissioners (except the Mayor) by the Governor only; gives the Governor power to fill vacancies (except the Mayor).

Section 5 provides that after November 1st, 1890, all the powers and duties of said Board shall be transferred to the Commissioners of the Sinking Fund.

It is unnecessary to notice further the provisions of the act, as they have no particular bearing upon the question.

It will be perceived by an examination of the above statutes that they are general acts, providing for general improvements in a certain class of cities. The nature of the improvements are public and not strictly private, in the sense that the City of New York alone has a direct pecuniary interest in the performance of the work, and that the improvement contemplated and provided for by the act has a purely local or special interest to that city. The general policy of the act, and object sought to be obtained, are the betterment of street and highways in cities. To clear such highways from incumbrances was a proper exercise of legislative authority, and indeed a subject with which the Legislature is directly concerned. *People v. Kerr*, 27 N. Y., 188, held that so far as public rights in streets are concerned, such as the right of passage and travel over them as common highways, the Legislature has supreme control over them.

It cannot be said, therefore, that the duties imposed upon these officials relate to corporate powers confined to the City of New York, or that members of the Corporation of said city alone are interested in the proper performance of them. The people of the State at large are interested in the safety and condition of the streets and highways in all the cities in the State. The Corporation of New York City is given no power under the acts to control the Commission in the discharge of their duties, it cannot remove them. They are independent of the corporation as to their tenure of office. They are paid by the State and removable by the Governor. The fact that their appointment was made by local authorities, and that the Mayor was joined with them, had no influence upon the question.

63 How., Pr. 104.

62 N. Y., 160, 170.

Heiser vs. The Mayor, 104 N. Y. R. 73.

The case of *People ex. rel. Ryan v. Civil Service Commissioners*, decided by Judge Lawrence, and reported in 17 Abb. N. C. 64, which holds that the Aqueduct Commissioners of the City of New York are officers of that city, proceeds upon the ground that the work to be performed, and improvement provided for, is for the especial benefit of the corporation as a corporate body, a city work, and one for the peculiar pecuniary benefit of the city. The act authorizing aqueduct improvement and appointing the commissioners is very different in its provisions as well as its purposes from the act creating the Electrical Subway Commissioners, so that I do not think the case applicable to or decisive of the present question.

From an examination of the statute and the authorities bearing upon the question, I am inclined to the opinion, therefore, that the Commissioners referred to are State officers in the sense that they are the agents of the State rather than the City of New York.

Very respectfully,

Your obedient servant,

CHAS. F. TABOR, Attorney-General.

The following rules and regulations of the Consolidated Telegraph and Electrical Subway Company were read:

RULES AND REGULATIONS GOVERNING THE OCCUPANCY OF THE
SUBWAYS OF THE CONSOLIDATED TELEGRAPH AND
ELECTRICAL SUBWAY COMPANY.

1. All applications for space in the subways shall be made in writing and shall give

- [a] The name of the applicant.
- [b] The term for which the use of the conduit or conduits is wanted
- [c] The number, material and dimensions of conductors proposed
- [d] The arrangement of said conductors, whether singly or in cables, and if in cables, the number of conductors and their disposition in each cable.
- [e] The maximum electro-motive force of the machine or machines supplying the current to be used.
- [f] The nature of the insulating material or materials to be employed, and
- [g] Such other specific information as will fully explain the use to be made of the space desired.

2. All applications for permits to make repairs or alterations in conductors in the subways shall be made in writing, and shall give

- [a] The name of the applicant.
- [b] A complete identification of the conductor or conductors referred to and of the particular conduit or conduits to which access is desired.
- [c] So far as possible the extent and character of the proposed repairs or alterations, and of the probable date when the same will be completed and the conductor or conductors restored to condition for use.
- [d] The insulation resistance of the conductor or conductors as shown by the latest test, and the date of said test.

Immediately after any repairs or alterations are made to a conductor or conductors, a report giving them in detail shall be made to the Subway Company.

3. Whenever, in the judgment of the Subway Company, or its properly authorized agent, repairs or alterations in a conductor or conductors are necessary, said repairs or alterations shall be made by the party owning or controlling said conductor immediately upon notice. During the progress of any repairs or alterations upon or in a conductor or conductors, the party owning the same shall take such precautions as may be necessary or expedient to protect the conductors of other parties from injury.

4. All conductors drawn into and operated in the conduits, and intended to convey currents of an electro-motive force exceeding one hundred [100] volts, shall have, at the temperature of 75 degrees Fahrenheit, an initial insulation resistance of not less than fifteen meg-ohms, per mile, per one hundred volts electro-motive force of current in the circuit. Whenever the insulation resistance of a conductor as aforesaid shall prove to be less than five [5] meg-ohms, per mile, per one hundred volts, the use of that conductor shall at once cease, unless the actual electro-motive force in its circuit be reduced so as to re-establish the foregoing ratio.

5. The insulation resistance per mile length of all branches and feeders of the main conductors shall at least equal that of the respective conductors to which said branches and feeders are connected.

6. The insulation resistance of each length of cable or conductor shall be determined before said length is laid in the subway. In making this determination an electro-motive force of current of not less than one hundred and fifty volts shall be employed, and the minimum initial resistance as provided in Rule 4 shall not be diminished through and after an immersion of the conductor under test of at least sixty consecutive hours. All lines shall be tested for insulation resistance immediately after completion in the subway, and those carrying currents of over one ampere shall be tested daily thereafter for a period of one month, and thereafter at least weekly. A conductor shall be tested for insulation immediately after any new connection with, addition or repair to, or alteration of any sort, in said conductor is made, and also whenever any other conductor is placed in the same tube; conductors conveying currents of less than one hundred [100] volts electro-motive force are excepted from this rule.

7. All tests and determinations called for by these rules shall be made by parties owning or controlling conductors. Duly authenticated records of the results of such tests and determinations within 24 hours after the completion of the same shall be filed with the Subway Company, which shall have power to verify or repeat such tests or determinations in its discretion.

8. All alterations of or additions to the subways for the purpose of connecting conductors therein with points outside will be made by the Subway Company upon the request of the lessee desiring the same, provided the same have been authorized by the Board of Electrical Control, and the expense of making such additions or alterations is satisfactorily guaranteed by the parties desiring them.

9. Rental to be paid yearly in advance. Applicants will be required to enter into a rental contract, with satisfactory guarantees for its performance.

10. [a] All manholes will have the inner cover locked with a special manhole padlock of the Subway Company, the keys of which shall be kept in the Company's office.

Any attempt to gain admittance to the manholes and access to the Company's property or to the property of its tenants without a permit from the Company, by

opening or breaking said lock, cover, bar or other portion of the manhole, will be prosecuted to the full extent of the law.

[b] Access to the subways shall be limited to the authorized representatives.

"a," of the Board of Electrical Control.

"b," of the Consolidated Telegraph and Electrical Subway Company, and

"c," of the lessees or occupants of the ducts.

[c] Access to the subways will be had by permit issued to the applicant by the Subway Company upon a written application in the name of the lessees or occupants of the ducts filed in the office of the Company, giving 24 hours notice.

There will be no delay by the Company under ordinary circumstances in giving access to the subways, but in cases of emergency the Company reserves the right, in their judgment, to deny access or to postpone the same.

[d] Access to the subways shall only be had in the presence of a Subway Inspector of the Subway Company, who shall hold possession of the keys to the manholes; who shall see that the manholes are properly opened and closed by the applicant, who shall remain present during the operations of the applicant, and who is hereby charged by the Company with the duty of seeing that the Company's property and the property of the tenants of the Company are not injured by the operations of the applicant. The inspector is also charged with the enforcement of all Rules and Regulations relating to the use of the subways, and he may suspend any employee of the applicant engaged on the work connected with the subways who shall violate any of these rules and regulations.

The Subway Company by its properly authorized agent shall have authority to require such alterations in conductors as it may deem necessary for their safety or the safety of the subway or of the adjacent conductors; and also to cause the current in any conductor to be interrupted or reduced for such period of time as may be requisite in the judgment of said agent for the proper protection or necessary convenience of persons working in the manholes or upon the subways in the vicinity of said conductor.

[e] Whenever a manhole is opened, the applicant shall place an iron frame, furnished by the Subway Company, in the street opening, with a red flag about one foot square with the letters "C. T. & E. S. Co.," thereon displayed on a staff set in a socket in the frame, as a warning to the public.

[f] When the manholes are opened, before commencing work, the applicant shall satisfy himself that they are free from gas, and if not, he shall ventilate the manholes. The Subway Company will provide for such purposes a fan or blower to be operated by the applicant for such time as may, in the judgment of his authorized representative, be sufficient to clear the manholes of gas to such an extent as to render it safe for his workmen to enter therein; and no light shall be used by the applicant in his operations in the manholes except when the above examination has shown the absence of gas. If, after the first ventilation, gas is noticed, the applicant shall cause the ventilation to be continued.

[g] In all work conducted in the manholes, one man shall always be provided by the applicant to act as watchman on the surface at each manhole when open, who shall keep constant guard and warn pedestrians, drivers of carriages, trucks, street cars, etc., and who shall assist the Subway Inspector in whatever the latter requires in emergencies.

[h] The applicant shall prohibit his employees from smoking in or around manholes.

[i] No one under the influence of liquor shall be allowed to engage work in the subways.

[k] No cover of any kind whatsoever shall be allowed by the applicant to be placed over the manhole opening; but a shield may be placed around the windward half of the iron frame to protect the workmen from dust and wind.

11. In no case will the Subway Company be responsible for any damage whatsoever to persons or property due to the existence or employment of the subways or the conductors therein or any apparatus connected therewith. The Subway Company will, however, use every reasonable precaution to prevent damage from any cause within its control.

12. The Subway Company reserves to itself the right to add or to amend these Rules from time to time, as may, in its judgment, be necessary, subject to the approval of the Board of Electrical Control.

Commissioner Gibbens moved the following resolution:

Resolved, That the rules and regulations submitted by the Consolidated Telegraph and Electrical Subway Company be approved by the Board.

Adopted; Mayor Hewitt declined to vote; others voted "aye."

Commissioner Gibbens moved the following resolution:

Resolved, That the Mayor be requested to order the removal, by the Commissioner of Public Works, through the Bureau of Incumbrances, of the following wires, poles and other fixtures, the ninety days' notice required by law having expired without their being removed by the owners or operators thereof, to wit: on

Broadway, from 14th to 45th Streets.
19th Street, from Sixth to Fifth Avenues.
23d Street, from Sixth to Fourth Avenues.
24th Street, from Sixth Avenue to Broadway.
25th Street, from Sixth Avenue to Broadway.
26th Street, from Sixth Avenue to Broadway.
27th Street from Sixth Avenue to Broadway.
28th Street from Sixth Avenue to Broadway.
42d Street, from Sixth Avenue to Broadway.
Sixth Avenue, from 18th to 50th Streets.

And in this matter, in view of the failure of the Mayor to direct removals when previously requested to do so by this Board, the Secretary is requested to call the attention of the Mayor to the following conclusions of the Board:

First: It is the duty of the Mayor to direct the removal of poles, wires and other fixtures from the surface of the streets when requested to do so by this Board, under circumstances such as surround the cases presented.

Chapter 716 of the Laws of 1887 provides for the appointment of a Commission, and the last report of the Board says:

The state of affairs in New York under this act may be briefly summed up as follows:

A commission of four members, one of them being the Mayor of the City, ex-officio, is constituted, with full authority over all the electrical conductors in the City

of New York, and with the special ministerial duty of changing the present overhead systems to underground systems by the providing of subways suitable for occupancy by the companies doing business at present with overhead conductors.

A construction company (the Consolidated Telegraph and Electrical Subway Company) is authorized to construct the subways designed by the Commission, and to permit the use of them by electrical companies upon fair and impartial terms.

Over the excavations of this construction company in the streets, the local authorities, represented by the Commissioner of Public Works, have full control.

Its profits are limited to ten per cent. on the money actually invested by it in carrying out the directions of the Commission—the excess going to the city; and to all its books and accounts the local authorities, represented by the Comptroller, have access.

A provision of law makes it incumbent upon the Board to give to companies operating conductors overhead ninety (90) days of notice for the removal of their overhead wires after a sufficient construction of subways has been made ready in any street or locality—reference being had to the general direction of the wires in use; and in the event of the company so notified not removing their poles and wires from the streets before the expiration of the ninety days of notice, it is provided that the local authorities shall thereupon remove them.

Second: The Board has presented cases eminently requiring the application of the remedial clause of the act referred to, inasmuch as the poles and wires of the Telephone Company referred to are practically abandoned, and if not removed by the proper authorities, are liable to decay and fall in the streets, while the indisposition of the companies owning or operating the Electric Light fixtures referred to, to convert their overhead systems to underground ones, is a menace to the work of this Board, the success of which is a matter of general public interest.

Third: The continuance of the electric light wires referred to, above ground, is fraught with danger to the lives and property of citizens.

The electric light conductors, however, are very dangerous both to life and property, whenever improperly insulated; and improper insulation of these dangerous and deadly wires is to be found almost everywhere throughout the city. The only regulations affecting the use of electrical conductors in the City of New York prior to the organization of this Board, were a few resolutions of the Board of Aldermen which have never been, so far as this Board is able to ascertain, at all regarded or complied with; and the provisions of the Fire Underwriters in reference to the insulation of the arc lighting and power wires, which though probably sufficient to protect property if strictly adhered to, are of little avail owing to the absence of proper inspection and supervision of the wires from time to time, as their insulation becomes affected by the elements and by natural decay and deterioration.

The chief provisions of the Board of Underwriters are to the effect that the electric light wires must be of the kind known as "underwriter's wire," and that they must not in any case be carried over buildings.

"Underwriter's wire" is a wire covered with a tape saturated with white lead, and a certain length of usage renders it susceptible to moisture. After being in use still longer the tape rots away and leaves the naked wire exposed.

In many places in the City of New York electric light and power wires are carried dangerously near buildings, awnings, telegraph and other poles, lampposts and other street obstructions.

EXTRACTS FROM PAPERS.

(The Courier—Official Paper City and County.)

BUFFALO, Monday, February 6, 1888.

THE DEADLY WIRES.

Lessons Pointed by the Sad Fatality of Last Saturday Night—What the Experts Say—
No More Doubt of the Electric Current's Capacity to Kill.

The accident Saturday night by which Isaac Morton and a horse belonging to the Pioneer Co-operative grocery store were killed is one of the most novel in the history of electricity. The details of the affair, although hastily obtained, were in the main correct as given in yesterday's Courier, with the exception that the victim's name was Morton, not Moulton, as reported that night. He was a porter on the Michigan Central Railroad, and was about to take a train out to New York City. Morton was thirty-one years of age and has a wife and two children living on Lafayette Street, Detroit. His family have been notified of his death, and his brother was expected here last night.

Shortly after 1 o'clock yesterday morning Coroner Kenney was notified, but was unable on account of ill health to take charge of the case. About six hours later Coroner Durney came and had the body removed from the Emergency Hospital to the undertaking rooms of Johnston & Wilkins, 162 Pearl street.

The body shows that Morton must have caught the wire with his left hand, for the flesh on the fingers were burned deeply, while across the right was a slight burn, which showed the wire had just touched or grazed it. According to the electrical experts, the current of electricity must have passed from the hands to the spine, running thence to the heart. If this supposition is the true one, death must have been almost instantaneous, if not quite so, though there is plenty of evidence to show that he called for assistance after he received the shock.

"I think he was dead when he was taken to the drug store," said Dr. Murphy, the resident physician, "and in all probability he died almost instantly. The heart would flutter—give a few beats after he was practically dead. I do not think the poor fellow knew what hurt him. His face showed that he had suffered no pain."

Robert James Davis, the boy who was driving the horse, recovered within fifteen minutes after he reached the hospital. He was very anxious to go home, and went there in a hack. The shock he sustained was very slight, though it was impossible to touch the sleigh prior to the time the wire was cut by the lineman without receiving a slight shock. This was due to the damp air.

The telephone wire was what is called a house wire—one strung from the pole to a house. The breakage was not between the poles.

So far as could be learned, Morton's death is the first one on record from a like cause. There have been many deaths from electricity, but this is the first instance

where a telephone wire falling across those of the electric light has caused the death of a human being. Some time ago a horse was killed in a similar manner in New York City, at the corner of Fourth avenue and Fourteenth street, and medical sages were divided as to whether death was caused by electricity or heart disease.

People were discussing the accident yesterday, and saw in it further necessity of burying the wires. With accidents of this kind frequently happening, combined with those at the railway crossings, the growth of the city might be checked to a considerable degree.

"I don't know what more there is to it," said John C. Weber, superintendent of the Brush Electric Light Company, "for you had a complete account of the accident this morning. I am very sorry it occurred, but it was an accident, and I can't see that any one is to blame. The night was dark and wet, and the conditions for making an easy circuit for electricity very favorable. I have never heard of any accident like this before. Telephone and electric wires get crossed frequently, and that is one of the reasons why I happened to be on the ground so early. I knew the lights were out somewhere on the circuit. I knew there was trouble, and I found it where the accident happened. Ordinarily there would have been little danger, for people would have seen the wire and kept away from it.

"Our wires are run with a metallic circuit. The reason why this wire completed the circuit when it touched the ground was that the telephone is run on a ground circuit strictly. If the telephone wires did not cross ours, why, the accident could not have happened. I do not see how it could be done, though. The wires might be buried, and then I suppose the thing could not occur. Still I do not think there is to be a general slaughter of people by this method, for this is the first death of the kind I ever heard of. I do not think there would have been so much danger if the night had not been so dark and wet. Had an electric light wire broken it would have cut off the circuit. As to the dispute which arose in New York City over the question, I can only say that last night fully demonstrated that the current is strong enough to kill."

Another official of the Brush Electric Light Company said that if there was any fault it should be laid to the telephone company, for the wires ought to be made so strong that they could not break. There was considerable danger, but not so much as people imagined. If there was, why, accidents would have been more frequent.

F. P. Little, of the United States Electric Light Company, said firmly that he would not like to talk about the accident. The Brush Company was a competitor with his company. On this subject of underground wires he was of the opinion that the matter was in its infancy. They were used quite successfully in Washington and Philadelphia. The accident was unavoidable, he thought, though he had not investigated the matter.

Charles J. Plumb, the city electrician, said that there was no doubt that there was considerable danger from telephone wires breaking. If the wires were strung on opposite sides of the streets there would be but little danger. As it was, there would be frequent accidents, though not of this character, perhaps. He had frequently seen the wires on fire, caused by the telephone crossing with the electric light. The city had decided that the wires should be buried, but it would be years before it was done. Conduits had been laid but the wires had not been buried yet. In England the law was that the electric wires should be strung on the tops of the highest buildings, at least eight feet from the roofs, so that they should not interfere with

the work of the firemen. It was the best solution of the difficulty that he could think of. He further stated that the electric light companies were obliged to use a metallic current, and that unless there was a ground circuit with the telephone wire the accident could not have happened. Continuing, Mr. Plumb said:

"The great trouble has been that the city has not worked under any system whatever. When anything is wanted the council passes a resolution or the people go to the legislature and get an act passed for some kind of relief, which is amended unless it is entirely useless. The way to do is to appoint an electric commission, men who understand the subject, and let them work out the problem. When this is done we will have something feasible, but not until. The subject has been discussed considerably, and electricians do not agree. Such accidents are liable to happen at any time. During cold weather or storms the wires are liable to break, and he who touches one of them so as to make a circuit, is sure to be killed."

All that is necessary to make the circuit referred to is to have any naked wire touch a telegraph, telephone or electric wire and have both ends of the naked wire touch ground, then the electric current is diverted and conveyed to the ground. That the current is strong enough to cause death, the accident of Saturday night demonstrated. This proposition seems to have been doubted by the electricians in New York. In the accident referred to—that of killing the horse at Fourth avenue and Fourteenth street—the wire belonged to the Brush Company, and Superintendent McGrath is quoted as saying at the time: "The company uses the high pressure system, but I am doubtful whether the current is strong enough to kill a man. However, I would not care to try the experiment." It is quite evident that Mr. McGrath has an extremely level head.

Foreman Walker, of the United States Electric Lighting Company of New York in giving his opinion upon the subject, was also very doubtful if the current was strong enough to kill a man. "We use," he said, "the metallic circuit and insulating wires. A break in the current which is supplying any given system of lights would probably throw off the belt from the shaft of the dynamo which supplies the current. All the lights on that system would go out and the current would be stopped. When a telephone or electric wire gets across our wires the machine gives a peculiar little shriek and the fact is detected. Probably the current would be stopped in such a case. Our machines are on the low-tension system and I do not believe that the current supplied by them is ever sufficiently strong to kill any one. This accident did not occur from the entanglement of any other wire with those of our system."

The following remarks by D. L. Gibbens, Commissioner of Electrical Subways for New York City, will apply to Buffalo very pertinently. He says: "No attempt has been made heretofore to control the method used by the electric lighting companies in insulating their wires, except by the underwriters, and they have only dictated what must be done in order that insurance policies be granted to those cases where the wires come into close proximity to the building to be insured. All that they require, even in such cases, is that those portions of the wires which are in proximity to the buildings shall be insulated by a covering of tape saturated with white lead over the copper wire. It only takes a short time for this covering to become sensitive to moisture, and then with each heavy rain or snow storm they become completely saturated, so that all the electric light wires after each such storm are practically naked. In many places the tape of which the covering is made hangs in ribbons, and there the wires are naked all the time. The truly remarkable circumstance is not that accidents occur, but that many more of them do not occur.

The true remedy is that the wires shall be placed underground, and then there will be no danger of contact with death-dealing conductors. If the electric light companies would keep their wires properly insulated, without waiting until they are compelled to, and if they would put up new wires whenever the insulation becomes deteriorated, no accidents would occur. But as this seems hopeless, their wires must go underground, and, until then, a rigid inspection must be enforced."

(From the New York Sun.)

MURDER BY ELECTRICITY.

If one of the officers or agents of an electric light company had shot a boy in the street, or stabbed him or beat his brains out with a club, the community would be greatly startled and shocked, and a trial for murder would follow. If these people, however, set a death trap at the foot of a telegraph pole on the sidewalk wherever they see fit, it is a mere accident and not a murder, when a poor lad is instantly killed by a silent shock of electricity. There is a burial in Potter's Field, and the practical electrician whose carelessness has cost a human life eats his dinner in freedom and draws his salary just the same. Meantime, the authorities devote themselves to the important task of punishing a middle-aged woman who has made a prominent lawyer believe that Raphael has a paint brush with a handle long enough to reach from heaven to New York.

We invite the attention of our Haroun-al-Raschid in the City Hall to this electric wire homicide.

Its practical performance is quite as great as the flag question.

The young bootblack who was killed in East Broadway on Saturday night because he was guilty of the crime of leaning against a telegraph pole, does not care what sort of a flag floats above the City Hall.

Let the American flag fly there, but let it be significant of the protection which American law should afford to life, as well as liberty and the pursuit of happiness.

(From the New York Sun.)

DEATH ON TAP IN THE STREET.

YOUNG MEYER STREIFER WAS KILLED BY AN ELECTRIC LIGHT WIRE.

And Somebody Ought to Explain Why an Uninsulated Wire of the United States Company was Permitted to Hang in Contact with a Fire Alarm Telegraph Pole.

The young man who was killed by the current from an electric wire in front of 7 East Broadway at 12.15 o'clock yesterday morning was Meyer Streifer, aged 17 years, who got a living by peddling cheap jewelry in Harlem. He lived at 49 Forsyth street, and was going home when the accident occurred, having just got off a downtown train of the elevated road at Chatham square. The wire that he came in contact

with was wound loosely about the base of a pole of the fire alarm telegraph, and the upper end was fastened to a crosspiece which supports the wires of the Fire Department.

The wire was part of what is known as the "dead" wire, that is, one temporarily out of use and disconnected from the signal boxes. The wire had evidently parted, and some one, to avoid the trouble of cutting off the dangling fragment, had carelessly wound it on the pole.

Midway between the crosspiece and the ground two wires of the United States Illuminating Company pass very near to the pole, one of them so close that it has to be prevented from touching the pole by a porcelain insulator. The iron wire depending from the crosspiece was in contact with one or both of these electric light wires, and that the insulation was defective is shown by the transmission of the current to the point where Streifer came in contact with it. It is supposed that Streifer carelessly threw his hand against the pole as he was walking by. The shock he received threw him down. He uttered a few cries, and Patrolman MacAuley and several other persons ran to his assistance, but in five minutes he was dead.

The policeman examined the wire and telegraph pole and saw sparks playing between the wire and an iron hook driven into the pole near it, and about eight feet above the ground. Both electric light companies sent linemen to investigate, and one of them cut the wire off near the iron hook. Later in the day another lineman cut off another section and left about fifteen feet of the wire still dangling from the crosspiece.

At the works of the United States Company no positive information about the condition of the wires at the point where the accident occurred could be obtained. One of the men in charge of the Fulton street station said he had never known the current from their wires to kill anybody, and he didn't believe it was strong enough to do it.

Superintendent Smith, of the fire alarm telegraph, says the electric light companies have no authority to attach their wires to the poles of the Fire Department or to permit them to pass the poles in dangerous proximity. Their constant assumption of this right, he says, is a perpetual annoyance to the Fire Department, which has been making strenuous, but thus far unavailing, efforts to stop it. Mr. Smith suggests that the iron wire that got crossed with the electric light wires was probably not a fire alarm wire, but a fragment of wire belonging to a telephone or telegraph company that had taken the liberty of attaching it to the Fire Department's pole.

Young Streifer was a Roumanian Jew, and was the chief support of his mother and nine brothers and sisters. The electric current left blue marks on his finger tips and shoulder. The family came to this country about a year ago. The father is still in Roumania.

The man who fell at East Broadway and Catherine street a few minutes after the accident to Streifer, and who was supposed to have suffered a similar shock, turned out to be simply drunk.

Fourth: The claims made by the electric light companies referred to, to the effect that their conductors cannot be placed underground without destroying their business; that the matter of undergrounding arc currents is entirely experimental, and that the Board should cause experiments to be made before requiring any action on their part,

are misleading, designed to obscure their disobedience of law not founded on fact nor borne out by experience.

In an account of the Pittsburg Electric Light convention, published in the *Electrical World* of 3d of March, will be found some very interesting information on this subject.

Mr. W. W. Leggett, of Detroit, the chief opponent of the undergrounding of electrical arc wires, says:

From the fact, therefore, that telegraph and telephone and incandescent electric light wires may be trained underground with success, by no means does it follow that the same is true of arc light wires.

It is an undoubted fact that to successfully underground electric arc light wires involves simply and solely a question of expense. But expense may be of the very essence of the inquiry, for if the expense is out of proportion to the revenue that can be derived from the service, expense alone prohibits the outlay and determines it to be impracticable. Expenditure of money is alone required to tunnel the Dover straits, and yet French and English capitalists have pronounced it wholly impracticable, as the returns could not warrant the investment. So it is with electric arc light wires; an efficient system so far as inventive ingenuity has yet presented any plan involves an expenditure wholly prohibitive, and for that reason alone is impracticable.

Electric arc light wires may be employed successfully, trained in the air on poles, and an underground system is practicable which can reproduce the same conditions.

Statements of others were as follows:

Mr. B. E. Sunny: The statement was made this morning, in the very excellent paper read by Mr. Leggett, that while it was entirely practicable to work telephone and telegraph wires underground, it was not practicable to do so with electric light wires. I remember distinctly that, six years ago, when the question of putting wires underground in Chicago first came up, the telephone interest gathered its experts together, and in meeting assembled they each and every one of them avowed, with all sincerity and earnestness, that while it was possible to work telegraph and electric light wires underground, it would be utterly impossible to operate telephone wires in that manner. The amount of crow that we have been compelled to eat in that time can be estimated when it is understood that there are 2,000 miles of underground wire working in Chicago to-day. As a matter of fact, the whole electrical interest opposed the measure and left no stone unturned to defeat it. The more they fought, the greater became the general clamor for the renewal of the wires. The same thing occurred to which Mr. Leggett referred as having occurred in Detroit; the statements put forth in good faith and all truthfulness by the electrical fraternity were discredited by everybody on the other side. The authorities exercised their power in its severest form by ordering the removal of every pole and wire from the public streets within a specified time. The prohibition included the entire city of 48 to 60 square miles, acres upon acres of which are vacant, miles upon miles of the streets of which are uninjured and sparsely settled, and alleys in passing through which one instinctively holds his nose and breathes as little as possible.

The point that I think can be made is that it is not the best policy to fight a measure in which the public seems to be so greatly interested, but to find a way to give them 10 or 15 per cent. of what they ask for, if in reason it can be done.

Mr. T. C. Smith: I wish to state that our company here in Pittsburgh is probably as much interested as any company in the country in aerial wires. We have an enormous amount of pole line already set up in this city, and we are doing immense business from that pole line, and I do not know that we should feel inclined to take the whole of that wire down and go underground within a year or within two years. But it is very evident that the public demand is urgent that the wires be put underground wherever feasible, and our company, without being asked by the city, and without any ordinances being passed to compel us, has voluntarily undertaken to try the experiment thoroughly. We have seen a great many people try to put their wires underground, and in most of the cases which have come under my personal observation the work has been done in such a manner that it is not a wonder that the cables burned out or that they ever got current through them. As Mr. Smith, of Detroit, has remarked, it is much more an economical question than an electrical one. With regard to one of the conduits of which Mr. Leggett spoke in his paper, viz., the conduit in Chestnut street, Philadelphia, I happened at the very time that the conduit was being put down there to be connected with another company in Philadelphia which was also putting in underground conduits. The underground conduits which our company laid were nothing but a lot of tin tubes put in a wooden box filled with pitch, and we hauled into it first-class lead covered insulated cables. We ran them for six or seven months without the slightest hitch and without a single burn-out. At the time that the cast-iron conduit was laid in Chestnut street it was laid without any attempt whatever to keep it watertight or airtight. It was nothing but an iron trough in two halves, and they made the absurd attempt to keep it airtight by putting putty along the edges. I saw a good many cables being put in, and in some of the cases where lead cables were used the ends of the cable were simply stripped for two inches of the lead, the ends spliced, and three or four turns of tape put around it. Yet that has been cited as a dismal failure of underground work. Now, I am not by any means arguing that all wires must go underground for the simple reason that companies that have spent an amount of money and have large vested interest in pole lines and wires and business cannot be compelled by any equity to remove the whole of that property and put it underground. In a great many cases it would be equivalent to send the company out of business. But I do think that companies should endeavor in the central parts of cities where the streets are crowded and the buildings are high and there is no doubt that the overhead wires are a nuisance—that they should make an honest endeavor to put them underground. With first-class work I see no reason why underground wires should not be successful. We have heard a great deal about the punching of holes through these cables. Any one who has had anything to do with are light machinery knows that if you take a 40-light Thompson-Houston machine for a 60-light brush machine and open the circuit suddenly you will discharge the field magnets into the line and if there is any weak spot in the insulation it will go through it at that instant. We have demonstrated it over and over again.

I think if the gentlemen who are trying underground wires will simply shut their dynamos down regularly by either short circuiting the armature or shunting the field circuit, that they will do away with a great deal of this punching of holes in the cables. In laying down three or four miles of lead covered cables we cannot expect to find them perfect in every part. There will be pinholes occasionally and the best inspection will not always discover them, but we have no right to assume because such things as that occur that the plan is impossible. There is not a man here present who has been in the electric business for a year who has not had a hundred cases of open circuits and short circuits on his overhead lines. The question is not whether underground wires are feasible or not, but whether we cannot get them established with about

the same trouble that we took to get our overhead lines in position. I am interested in a company in Philadelphia which is running the underground system entirely. We started with a 200-volt direct current system, and used the best lead-covered cable, put down by the most experienced men. We operated them six months without a trace of leakage, and then we changed over to the alternating system. We put a thousand volts into those cables, and they are running to-day and have been for nine months without a single ground having occurred on them. We have fifteen miles of cable buried all told. We have had the question before us as to whether it would not be possible to run the alternating current in the same box with telephone and telegraph cables. At the request of Chief Walker, the city electrician, we ran in the Long Distance Telegraph Company's conduit of 1,500 feet of 3-conductor cable. On the two outer wires we put our alternating current, and we placed a 20-light converter in the chief's office. Into the third wire we connected his telephone, and there is not a trace of interference on it. The telephone company, of course, had given Chief Walker permission to put that cable in their box, but they were a little nervous about the result, being afraid it would knock out their whole system between Philadelphia and New York. After we had been running about a week they came to us and wanted to know when we were going to start up. We told them that we had been running about a week, at which they were very greatly surprised, and they have made no objection to the occupation of the box by us. Of course. I had no real experience with arc lights underground, that is, high tension currents, beyond the fact that when I put down my lead cables in Pittsburg I used a 65-light Brush machine to test them with.

We have proved beyond any question that the alternating current can be put underground and can be put in lead covered cables without any danger of loss of current. If the direct wires cannot go underground, the alternating can. And it may be that we shall be called upon to put in new apparatus which we do not want, simply because it cannot go underground. I think that in a case of this kind it is not the technical press we have to consider; they can realize the difficulty and danger and troubles of going underground. But it is the public press we have to consider. While they certainly do not always express public opinion they have a good deal to do with moulding it, and a persistent attack by the press on a lighting company will compel it to do what they desire. I think the sooner this question of underground wire is placed fairly, the better it will be for all of us.

Mr. Wilbur: Last spring we laid over two miles of underground cable in Philadelphia in the grounds of Girard College. We are running 47 lights on two 25-light machines. We have never experienced a particle of trouble with the cable from the time it was laid up to date. Where the cables come out at the top and are connected with overhead wires there have been one or two grounds and leaks and lightning troubles, but no serious defect of the cable.

NEW YORK, April 13th, 1888.

To the Honorable Commissioners of the Board of Electrical Control.

GENTLEMEN: In order to ascertain the results of electrical companies using the subways in Chicago, I made a visit to that city last month, and personally inspected the operations of the various companies in the subways in that city.

I was enabled to obtain some valuable information as the results of the operation of the electric light, both arc and incandescent currents. For the same I am indebted to Professor Barrett, City Electrician of Chicago, Mr. ——— Fay, ex-President, and

Mr. ——— Sunny, President of the Consolidated Arc Light and Power Company, of Chicago, which comprises all the arc light service of Chicago doing commercial or private lighting.

The different electric companies in Chicago are allowed to use their own devices and bury their own wires, as they see fit. The effect of this was that several systems were used, and the experience so gained had lead in a great measure to the opinion, that for safety and efficiency, iron pipe imbedded in cement is more reliable than any of the patented methods tried.

About four miles of a 7 to 9 duct conduit, made of the Dorsett asphalt concrete was laid in 1885, and is still being used.

There was one company organized that constructed a conduit for the purpose of renting out the space to any party desiring to use the same, and the control of that company is now vested in the Consolidated Arc Light and Power Company, which is operating wires and cables through it and supplying about fifteen hundred arc lights to private consumers through this underground service, which covers an area of about one by four miles. The streets of the city are lighted by gas.

Professor Barrett, City Electrician, informs me that the municipal service comprising twenty-six hundred incandescent lights, together with the fire and police telegraph, are all operated in subways, and during the past two years have proved entirely satisfactory, and that the city is now under contract and in process of having constructed an arc light service for the purpose of lighting the bridges and the river front, and that he has succeeded during the past year in having removed from a part of the business streets of Chicago all the poles and fixtures in the streets, comprising about seven hundred poles and four thousand miles of wire.

Their system of telegraph and telephone distribution is almost exclusively on housetops, access to the block being obtained from manholes at the intersection of streets, by carrying the wires from the manholes to the sidewalk through an iron pipe to the cellar of the corner house on each block. And for arc lighting, from the manhole to curb line and around the block, or along any portion of it, by means of an iron pipe under the sidewalk, or in the gutter. Loops are made from this pipe wherever service is desired. This plan gives satisfaction, and the area of streets that has been cleared of poles and wires is gradually being extended from the business centre.

I found, in Chicago, that the subways are constructed of the same material that we have tried in New York, a large part comprising Dorsett material and iron pipe, and the preference, I infer, being in favor of iron pipe, as that is the material used in all the additions now being constructed.

The imaginary danger and difficulty to the arc light service when it is put under ground, as represented by all the arc light managers in New York City, I am convinced, is merely a makeshift, in order to avoid the expense that will be incumbent upon them to buy new cables and pay a rent for occupying the subway; and my opinion is confirmed by information received from the President of the Consolidated Arc Light and Power Company, in Chicago, who told me that now he is established with his cables in subways, he would not ask permission to go back to an overhead service.

The prevailing opinion seems to be, among those whose interests in the question are most direct, that provided a conduit is built of strong material, such as affords ample protection for the cables within it, it matters little what that material consists of.

The great necessity is to secure such cables as will be least affected by the varying condition of the interior of the streets. Some cables used are said to have given satisfaction for a considerable period, but suddenly collapsed and caused burn-outs and other serious trouble. The result is that the operating companies are now confining themselves largely to the use of lead-covered cables, such as the Telephone Company is placing in the subways in New York. For the protection not only of the subways themselves but of the property within them, it would seem to be very requisite to have a strict enforcement of the rules and regulations formulated by your Board in this particular.

Given such supervision there cannot be, judging from the experience of others and from what I have seen, any question that electric lighting can be efficiently and economically done underground in such subways as have been constructed here.

Very respectfully,

HENRY S. KEARNEY, Chief Engineer.

Fifth: The Board is and has been most liberal in its requirements to the Electrical Companies in the city, and disposed to grant every privilege desired and every extension of time required by those evincing a determination to comply with the law.

"The policy of the Board is to insist upon the electrical companies converting their overhead systems to underground systems as rapidly as is consistent with the convenient use of their service by the public, and where companies in good faith are making preparations to enter the subways, no harsh measures seem desirable.

"So many considerations of preparing proper conductors, drawing them in, making connections and testing their efficiency, enter into the problem of removing overhead wires from any particular street or locality, that in very many cases the ninety days allowed by law may very properly be extended, and must be extended to avoid serious injustice to the companies, and inconvenience to their customers.

"In cases where preparations are not being made, however, or where poles and wires are abandoned, as is the case in one instance already, the remedial clause of the law should be rigorously enforced, and every effort will be made by the Board to that end.

"The liberality which the Commission has seen fit to exercise in the matter of additions to the conduits for the purpose of making local connections, allowing the Construction Company to furnish whatever the several companies desire for themselves from the manholes to the points desired to be reached, has been taken advantage of and promises beneficial results.

"For example—the Construction Company has at least in one instance employed the hand-hole system of distribution for the use of the telephone wires in down-town streets where it seems desirable, while at other points a single entrance into a block in connection with house-top distribution has proved efficient.

"The way in which the resolution notifying companies to place their wires in the subways was drawn, practically allow the companies operating wires to select their own methods of getting from the manholes to their subscribers, while at the same time the authority of the Commission over the Construction Company and its work, as well as the supervision of the Construction Company itself over the underground accommodations, is preserved.

"Diagrams showing the different modes of distribution are appended."

Sixth.—The information transmitted by the Mayor to this Board, to the effect that if the Mayor should order the removal of these fixtures the Commissioner of Public Works would refuse to act upon the order, for the reason that no money is available for the purpose, has been received by the Board with great surprise and concern.

The Board of Estimate and Apportionment in its wisdom, presumably foreseeing the necessities of the case, appropriated for the work of the Bureau of Encumbrances in the year 1888, a much larger sum than it has been the custom to appropriate in former years, as the following table will show:

TABLE.

Board of Estimate and Apportionment appropriated to Department of Public Works for "removing obstructions in streets and avenues":

1884. Removing	\$7,500	
Salaries	2,500	
		\$10,000
1885. Removing	5,500	
Salaries	2,500	
		\$8,000
1886. Removing	6,884	
Salaries	3,116	
		\$10,000
1887. Removing	6,884	
Salaries	3,116	
		\$10,000
1888. Removing	20,500	
Salaries	4,500	
		\$25,000

The language of the resolution of the Board of Estimate and Apportionment in making this liberal appropriation is as follows:

"For removing obstructions in streets and avenues."

The poles and wires and other fixtures referred to are clearly "obstructions" in the streets, inasmuch as they are unauthorized structures. They are, furthermore, nuisances, inasmuch as they have been specifically ordered to be removed in accordance with law, and the Board is confident that an imperative direction to the Commissioners of Public Works by the Mayor will be followed by the desired results.

If it is proper to expend the money appropriated for "removing obstructions," in tearing down a few feet of fence, erected at the expense of a woman to secure her privacy, because it extends a few inches beyond her property lines; if it is proper to expend the money in removing a stand from the corner of Fulton street and

Broadway, notably a convenience to pedestrians, because it is unauthorized, how can it possibly be improper to expend some of the same appropriation for removing immense structures, equally unauthorized, operated by contumacious corporations unlawfully for gain, extremely dangerous to life and property, occupying much more valuable space in the streets, unsightly in appearance, and objects of universal public condemnation and abhorrence?

Mayor Hewitt, during the reading of the resolution, offered the following:

Resolved, That the Board adjourn.

Lost; Mayor Hewitt voting "aye;" other Commissioners "no."

Mayor Hewitt, at this point, asked to be excused from further attendance on the meeting, and withdrew.

The original resolution was then adopted—all present voting "aye." Mayor Hewitt absent.

Commissioner Gibbens moved the following resolutions:

Resolved, That the Secretary is directed to request the State Civil Service Board to certify to this Board the names of persons applying for examination who shall be found suitable and qualified to fill the positions of four inspectors of underground construction. The said inspectors, after appointment by this Board, shall report for duty to the Engineer, who shall assign and instruct them in the supervision of the work done by the Consolidated Telegraph and Electrical Subway Company, which company shall pay said inspectors monthly at the rate of \$4 per diem for such time actually spent in the supervision of subway construction, as shall be certified to by the Engineer of the Board in the manner now in vogue as to inspectors of the Department of Public Works assigned to similar duty.

Adopted by a unanimous vote.

Resolved, That the Secretary is directed to request the State Civil Service Board to certify to this Board the names of those applying for examination who shall be found qualified for the positions of four inspectors of electrical conductors. Such inspectors of electrical conductors, when appointed by this Board, shall report for duty to the electrical expert, who shall assign and instruct them in the work of supervising the electrical conductors in the city, and who, from the result of such inspection, shall report to the Board, from time to time, the condition of the electrical service. The compensation of such inspectors shall be at the rate of \$4 per diem for the time actually employed under the direction of the electrical expert, who shall certify the same to the Secretary for transmission to the Comptroller, as a part of the necessary and incidental expenses of the Board.

Adopted by a unanimous vote.

Resolved, That the Secretary is directed to request the State Civil Service Board to certify to this Board the names of those applying for examination who shall be found competent to fill the position of electrical expert. Said electrical expert, when appointed by this Board, shall receive compensation at the rate of \$2,500 per annum. His duties shall consist in reporting to the Board, from time to time, the condition of the electrical service in the city; in recommending and suggesting improvements therein in conformity with the rules and regulations, and in advising on such matters as the Board shall direct. It shall also be the duty of said electrical expert to prepare and keep a book showing the condition of the overhead and underground service in all the streets and avenues of the city, and in such manner as may render the same available for ready reference by the Board.

Unanimously adopted.

Commissioner Gibbens called the attention of the Board to some rules and regulations for overhead wires, and offered the following resolution:

Resolved, That the following rules and regulations be printed in the minutes, to be acted upon at the next meeting.

Unanimously adopted.

Copy of the rules and regulations above referred to:

RULES AND REGULATIONS FOR OVERHEAD WIRES.

- I. Electrical conductors are divided into two classes.
 - (1.) Those for telegraph, telephone and similar service.
 - (2.) Those for electric light and power, and similar service.
- II. No two lines of poles bearing conductors of a like class shall be on any street or avenue.
- III. No two lines of poles shall be on the same side of any street or avenue.
- IV. All conductors of the second class shall be insulated.
- V. Poles shall be placed upon the sidewalk as near the curb as possible, and no pole shall be placed within ten feet of any lamp-post or other pole.
- VI. All existing regulations of the local authorities in regard to the placing of poles and stringing of wires are to continue in force.
- VII. All wires shall be fastened upon poles or other fixtures with glass, porcelain or rubber insulators.
- VIII. No wires of the second class shall be stretched within one foot of any pole without being attached to the same with glass, porcelain or rubber insulation.
- IX. No wires of the second class shall be stretched within twenty feet of the ground or within four feet of any building except when attached thereto with glass, rubber or porcelain insulators.
- X. No electrical conductors shall be stretched over any part of any house or other building, or attached thereto, except by permission of the owner thereof.

XI. The companies or persons owning or controlling poles in any street or avenue shall allow the same to be used by other companies or persons operating conductors for similar electrical service when authorized so to do by the Board, on tender of proper compensation, to be determined by agreement between the parties interested. In default of such an agreement the amount of such compensation shall be determined by the Board. This rule imports a contract on the part of each company or person owning or controlling the poles in any street or avenue, not only with the Board, but also with each company or person who shall under its terms be qualified to demand the privileges it confers.

XII. All permits of the Board for overhead wires and fixtures are granted only pending the providing of underground accommodations in the neighborhood of the street or avenue for which the permit is granted.

XIII. Any member or officer of the Board, and every inspector employed by it, as well as every member of the police force of the city, shall be entitled to examine permits under which work of any kind is being done.

XIV. No permit shall be granted for the erection of any overhead structure nor for the renewing of any lines already existing in any street, avenue or highway in which underground accommodations for the service have been provided, or are being provided.

XV. All poles now standing, or to be hereafter erected, shall be branded or stamped with the initials of the company owning them, at a point not less than five or more than seven feet from the street surface.

When an old pole is taken down it must be removed from the street the same day.

New poles must not be brought upon any street more than two days in advance of their erection.

Any pole that shall lie on any street more than two days shall be removed by the Bureau of Incumbrances of the Department of Public Works, at the expense of the party owning it.

XVI. All electrical companies or persons having poles in the public streets shall give a bond to the city in a reasonable amount, to be determined in each case by the Board, conditioned for the payment of the cost of removing dangerous and abandoned poles, and also for the payment of the expense of restoring the sidewalks and pavements where the same have been disturbed or injured in consequence of the erection or removal of any pole owned by them.

XVII. The violation of any of the rules and regulations of the Board, shall operate ipso facto by a revocation of the permit held by the company or person guilty of such violation.

XVIII. Whenever hereafter any company shall be permitted by this Board, or its successors, to erect posts or poles, or other fixtures bearing lamps or other devices for the purpose of lighting by electricity, the streets, avenues, highways, parks or public places of the city, the said permission shall be granted only subject to the following provisions, and the same is hereby expressly made a condition of said permits:

At any time when, by action of the city authorities, the contract for lighting any such street or other public place shall be given to another company, the company

erecting said lighting fixtures or lamp-posts shall, on tender of the first cost thereof, yield possession and ownership of the same to the said other company obtaining the new contract.

XIX. Electric light lamp-posts shall be in accordance with the plan adopted by the Board.

XX. All broken and "dead" wires, and all wires, poles, and other fixtures not actually in use, must be removed from the streets, avenues and highways of the city.

On and after the 17th of April, 1888, no poles or like fixtures shall be erected in the streets, avenues or highways of this city for the purpose of carrying electrical conductors, nor shall any electrical conductors, poles, wires or fixtures be placed above ground in any streets, avenues or highways where underground accommodations have been provided for the same by this Board for the space of ninety days, and when the Mayor has been requested to remove the same without a specific resolution of the Board certified by the Secretary.

The general permit giving electrical companies the right to repair their lines of electrical conductors where needed is continued, and is hereby made to include the making of connections necessary to the business of said companies with lines now in use.

This general permit does not, however, cover the erection in any street, avenue or highway of any new poles or other similar fixtures, and has absolutely no reference whatever to lines which have been ordered underground by the Board for ninety days, and which the Mayor has been requested to remove.

In the case of such lines, where notice has been given that underground accommodations have been provided, and the ninety days of notice required by law has elapsed, and the Mayor has been requested to remove the same, companies owning or operating said lines are not authorized to make any repairs or connections or to go upon the poles bearing such lines for any purpose whatever, except to remove the said lines of electrical conductors in conformity with the directions of the Board.

Any deviation from this rule requires a permit passed at a regular meeting of the Board, attested by the Secretary.

The Secretary is directed to furnish a copy of the rules and regulations, as above, to each Electrical Company, and to furnish copies to the Mayor, Corporation Counsel, District Attorney, Heads of the Police Department, and to request the co-operation of these officials in the enforcement of the same.

The Secretary is also directed to notify the corporations whose lines of conductors the Mayor has been requested to remove, that in default of the carrying out of its request by the local authorities, the Board will endeavor to prevent the operation of such lines of conductors by all proper means in its power, until such time as said corporations shall satisfy the Board of their intention of converting said lines to an underground system.

Commissioner Gibbens offered the following resolution:

Resolved, That the following discussion of the question of safeguards in the matter of stretching electric light conductors, which was read before the Electric Club of New York by Dr. George H. Benjamin, be printed in the minutes.

Unanimously adopted.

The following is the paper referred to:

FIRE AND LIKE RISKS IN ELECTRIC LIGHTING AND TRANSMISSION OF POWER.

In 1882 the Board of Fire Underwriters of the City of New York adopted a series of rules relative to the precautions to be observed in the introduction of the electric light into buildings, and which were published at the time, and with which you are all, doubtless, familiar.

However well these rules may have been suited to the date of their promulgation, I believe it will be generally admitted that they are unsuited and inadequate to the present needs. With all new industries, or the practice of new arts, it has been the rule to allow the utmost latitude, and to impose as few restrictions as is possible, compatible with public welfare, this with the idea of lending encouragement and facilitating the introduction of such new art or industry, but when, after a time, the industry or art has become well understood and established on a firm commercial basis, further and supplemental restrictions are generally imposed with the intention of making the employment of such art or industry absolutely safe for all concerned—those engaged in the practice thereof, as well as those using or being benefited thereby.

When the dangers arising from the employment of electric currents of such quantity or electro-motive force as are required in electric lighting, were first pointed out through the medium of the public press, there was a great hue and cry raised by those engaged in the business, and unstinted abuse was heaped on the heads of the unfortunates who had dared to have the temerity to advance such radical ideas. Time works wonders, and I doubt not that to-day even those employed in the business of electric lighting, see and feel the necessity of precautionary rules, and likewise the advisability of their most rigid enforcement. If any one present sees fit to question my premises as stated, I would respectfully refer them to the disastrous fires and terrible accidents which have been lately recorded in the daily press. Fires which caused the destruction of large amounts of valuable property, and accidents by which men were unnecessarily deprived of life. I say unnecessarily, as regards life, as the possibility of such slaughter should be guarded against by absolute prohibition, and, if necessary, by statutory enactment, making it a penal offense to direct or employ men, however experienced in that class of electrical work, where the slightest oversight or unavoidable slip means sure and instant death. Some of you may be inclined to argue that employers should not be held responsible for the carelessness and negligence of their men; that the men seek the employment well knowing the terrible dangers to which they will be subjected. To them I say that the root of the matter should be sought. The struggle for existence, and the difficulty in obtaining employment at the present time, is a most potent factor in causing those in need to seek and obtain situations, however great the risk entailed. If the remedy were directed toward the fountain head, and the principal or management of the company employing such dangerous currents were held personally responsible, then they would make it their business to see that no unnecessary risks were entailed, and they would, in effect, become guardians of their men. That familiarity breeds contempt is an old saw, and to warn the average electric light lineman or machine attendant to be careful is sure to provoke a derisive smile. "All right, I'll look out for myself," was the answer of an old and experienced employee in a Western city a few weeks since. In less than two minutes thereafter he was

stone dead. Thought the circuit was open. If the President of the Company had been fully aware that he would be held responsible for such an accident, he would have seen to it that the circuit was open, and a human life would not have been needlessly sacrificed. Some may argue that there are occasions when it is impossible to open the line without serious loss or public inconvenience, and that repairs may become necessary when the line is in full operation. To those I say that there can no occasion arise in which an employee must necessarily risk his life. What does it matter if one, twenty, fifty, or any number of lights be cut out? Nothing compared to a human life, and, particularly, as I maintain that no condition can arise where the necessity of cutting out any such number of lights is obligatory.

When a man under our laws is tried for his life, the law presumes him innocent. There are many cases on record where hundreds of thousands of dollars have been expended to save the lives of men probably not as worthy as either of the two poor fellows lately so wantonly slaughtered. More money, yes, twice over, than would have been required to buy out and obliterate the electrical companies owning the plant which caused their death. The good of the many (the public) may at times require the sacrifice of the lives of the few, but the good of an Electric Light Company is not the good of the public, and it is incomprehensible that a mere commercial concern should be allowed, by gross carelessness or ignorance, to sacrifice the life of even the meanest of human beings. Therefore, I contend that stringent and prohibitory means should be adopted to make such accidents in the future an impossibility; and further, that such rules should have the cordial support of every one having the true interest of electric lighting or the transmission of power at heart. So far as the risks from fire are concerned, it is not necessary to enumerate them, unfortunately sad experience has made them only too well understood. Careless, stupid, and one may say criminally loose, methods of wiring have been the rule rather than the exception in this country. Of course, with some notable exceptions, and all those who have carefully studied the subject and are conversant with the needs, feel that the enforcement of proper and stringent rules will not only allay public fears and restore confidence, but likewise materially benefit the industry.

I contend, gentlemen, that we should look upon this subject in a broad light, and free from the narrow prejudice of business. We should recognize the necessity, and not attempt to evade the responsibility. To make an electric plant perfectly safe may necessitate slightly increased cost of construction, although, personally, I am inclined to doubt the fact. But even admitting such to be the case, the perfect immunity from danger, the decreased cost of insurance, and the general confidence engendered in the public mind, will be a good interest upon such additional outlay.

Paper read before the Electric Club of New York, November 4, 1886, by Dr. Geo. H. Benjamin, of New York. Subject: "Rules to be Observed in Handling Electric Currents as Used in Electric Lighting and Transmission of Power."

The rules which I would submit to your consideration, are as follows: and have been compiled after a careful examination of those of all the fire-boards and underwriters' associations of the world. I have endeavored to make them as concise and clear as possible, and with the intention of providing as few onerous conditions as are compatible with absolute safety to life and property.

Such rules are comprehended under the headings—

I.—Rules to be observed in conveying currents of considerable quantity or electro-motive force in and through buildings.

2.—Rules to be observed in locating and constructing aerial and underground conductors.

3.—Rules to be observed to prevent accidents to life or bodily injury.

I.—RULES TO BE OBSERVED IN CONVEYING CURRENTS OF CONSIDERABLE QUANTITY OF ELECTRO-MOTIVE FORCE IN AND THROUGH BUILDINGS.

Rule 1.—The degree of E. M. F. that may be employed in an electric circuit within any building should not exceed 100 Volts for alternating currents, or 200 Volts for continuous currents. No departure will be allowed from this rule except by special permit, and then only for arc installations in large buildings where the whole plant is absolutely removed from public interference.

Rule 2.—The conductivity of all wires should be such that 100 per cent. more current can be transmitted through them than that estimated as their proper carrying capacity, without increasing their temperature above 150° F.

Rule 3.—No naked conductors allowed in buildings.

Rule 4.—All light and power circuits must be entirely metallic and of properly insulated wire. The employment of gas, water or steam pipes, or the earth as a part of circuit is positively prohibited.

Rule 5.—All conductors should be thoroughly well insulated with a material or materials as non-inflammable as possible, and which will not fray or become loose, melt at a low temperature (below 150° F.) or absorb moisture.

Rule 6.—All conductors that are exposed to moisture must be provided with a waterproof insulating covering.

Rule 7.—Where practicable, all conductors in factory or similar buildings should be so placed as to be readily inspected and tested.

Rule 8.—No conductor, whether bare or insulated, shall be laid in wet cement, plaster, mortar, or other similar material.

Rule 9.—All conductors carried through or within walls, floors or partitions, must be enclosed in separate metal, earthen ware, terra-cotta or asbestos board tubes, or their equivalent, and which should be slightly larger in their inside diameter than the conductors they are designed to carry. Conductors should not be placed above each other in such a manner that water could make a cross connection.

Especial care should be taken to protect all concealed wires from mechanical injury.

Rule 10.—Conductors conveying currents of considerable E. M. F. or quantity as for arc lights, power, charging of storage batteries, and the like, excluding secondary distribution, should be placed at least 6 inches apart, the same distance from conducting bodies, and at least two feet from other wires of smaller diameter placed parallel therewith.

Rule 11.—Conductors conveying alternating primary currents of high E. M. F. must be kept a minimum distance of 12 inches from each other, and enclosed in separate highly-insulating fire-proof casings.

Rule 12.—Conductors conveying currents for incandescent lighting and having a less E. M. F. than 200 Volts and run along walls or other exposed supports should be placed at least $2\frac{1}{2}$ inches apart, and a similar distance from all other wires or metallic bodies, except as provided in Rule 9.

Rule 13.—Conductors for arc or incandescent lighting currents should be placed in grooved mouldings or casings of wood or dry plaster, or like material preferably arranged along the cornice line, and in such case there should be a septum of the wood or material having a thickness of three inches for arc currents and one-half of an inch for incandescent currents between the wires; wooden mouldings may be rendered fire-proof by painting them with a solution of tungstate of sodium in water.

Rule 14.—Single or twin wire insulated conductors may be carried through electroliers or gas fixtures, but especial care must be taken to insulate such conductors from the metal parts of the fixtures.

Rule 15.—The location of all concealed conductors should be plainly designated by an appropriate mark.

Rule 16.—No metallic staples, nails, hooks or devices for attaching and supporting electrical conductors should be employed in buildings. Wooden cleats or porcelain saddles must be provided. Two conductors conveying high potential currents should never be included in the same saddle or cleat.

Rule 17.—Twin insulated wire may be employed in branches feeding single incandescent lamps in parallel of the main circuit.

Rule 18.—All joints should be mechanically and electrically perfect—the ends cleaned, united by solder (acid flux employed) and wrapped with insulating tape.

Rule 19.—Safety fuses should be provided at both points of junction of a branch circuit with a main circuit, and the conductivity of such fuses should in no instance exceed 50 per cent. of the current designed to operate the devices in circuit.

Rule 20.—Where practicable, all safety fuses for each room should be placed in a conveniently located fire-proof box, so that they can be inspected or renewed without inconvenience or injury to the premises.

Rule 21.—A cut-out switch which can be operated by the firemen or police must be placed in the circuit in a well-protected and accessible place.

Rule 22.—Magnetic cut-outs or circuit breakers should be used in preference to fusible strips on arc or power circuits, and should be adapted to be thrown into action by any increase of current amounting to 50 per cent. or less as specially required.

Rule 23.—Magnetic cut-outs for use in secondary distribution circuits should have double poles and arranged to act at 25 per cent. above the normal current and be placed as near the entrance of the primary conductors into the building as possible.

Rule 24.—Where incandescent lights are run on arc light circuits, fastening or attaching lamps to any gas or other metallic fixture which may be in electrical connection with the earth is prohibited.

Rule 25.—Distributor boxes on arc light circuits should be convenient for access, kept free from moisture and dust, and as far removed as possible from other electrical devices, pipes, metals, etc., or earth connections.

Rule 26.—Distributor boxes must not be placed in any circuit wherein the E. M. F. of the current transmitted exceeds 1,000 Volts.

Rule 27.—Distributor boxes must be arranged to automatically cut out the arc current should any defect arise, or accident occur either in box or incandescent circuit.

Rule 28.—In working distributors an ampere-meter should be included in the circuit, and connected with an audible alarm, so that warning will be immediately given should the current exceed the standard amount.

Rule 29.—All switches, cut-outs, safety-fuses, resistance-boxes, distributors, regulators and the like must always be mounted on a non-combustible insulating base.

Their contact surfaces kept bright and movable parts examined at least once a day.

Rule 30.—All switches must be quick in action and arranged to simultaneously make and break at both poles. Lapping connections and rubbing contacts are to be preferred.

Rule 31.—Arc lamps should never be employed in factories where there is fine dust, as from flour, pulverized cork or similar substances floating in the atmosphere.

Rule 32.—The frames and other exposed parts of arc lamps should be properly insulated from the circuit. Each lamp must be provided with a proper hand-switch, and whenever it is possible that an excessive current may be thrown onto any one lamp, or series of lamps, automatic shunts or switches must be provided for each lamp, to prevent all possibility of the formation of a dangerous arc.

Rule 33.—Arc lamps should be provided with means to prevent the carbons from falling out should the clamps fail to hold them.

Rule 34.—Arc lamps should have their globes closed at the bottom; and wherever they are placed in proximity to any combustible material, like draperies, goods in show windows, flyings in fabric factories, or in wood-working establishments, they must be provided with very high globes or spark arresters, and the globes be surrounded by wire netting to prevent the falling of a broken globe. Broken globes must be replaced at once.

Rule 35.—Incandescent lamps should in all cases be mounted in sockets, which effectually conceal the terminal connections. Safety-plugs should not be allowed in lamp holders.

Rule 36.—No dynamo or other source of dynamic electricity or motor shall be placed in any room of any cotton, woolen, flax, jute or flour mill, or similar mill of like description, excepting in the engine room thereof, and where it is necessary to locate a dynamo or other source of electrical energy or motor in a dangerous position; such generator or motor should in all cases be housed, and special permission must in all such cases first be obtained.

Rule 37.—Dynamos, generators and motors in all cases should be placed on dry foundations, and preferably raised from the floor by means of insulating skids. They should be kept free from accumulation of oil and dust. A main switch should be placed at or near the dynamo or motor.

Rule 38.—Dynamo electric machines should in all cases be provided with an automatic governing device capable of controlling any change in the current.

Rule 39.—Storage cells should in all cases be arranged with a space of one inch between the cells on insulating supports and in a dry place, a metal tank or tank lined with metal placed under them to catch any leakage. They should be kept free from moisture and dust, and preferably should be enclosed in a box, provided with holes for the escape of gas.

Rule 40.—Fusible safety strips should be located in the leads conveying the charging current to the storage battery, and in circuit from storage battery to translating devices. Switches should likewise be placed in both circuits. Magnetic cut-outs may be employed in place of fusible strips.

Rule 41.—All circuits should be tested at least twice a day with some approved apparatus designed for that purpose, in order to discover any ground connection or escape that may exist. A record of these tests shall be entered in a book provided for this purpose, and a transcript thereof furnished to the proper authorities once a week.

Rule 42.—Where secondary generators or transformers are employed they should preferably be located exterior to the building in a specially prepared fire-proof structure, which should be perfectly dry. Where necessity requires that they be within the building they should be housed in a dry, wooden room, lined with asbestos board. A cut-out should be included in the primary circuit, adapted to act at any increase of 25 per cent. above normal current. A warning or danger sign should be placed upon the door of such housing.

Rule 43.—When electric light or power circuits are intended to be constructed, full particulars of the proposed installations and all its details must be given in writing to the proper authorities. This must be accompanied by samples of the conductors, with a statement of the maximum current which it is designed to send through each.

Samples of the cut-outs, switches and fusible plugs should likewise be submitted, unless they have previously been approved. The signing of these rules and regulations by any electric lighting, power, or other company transmitting electric currents, shall be considered as a guarantee on their part that they will faithfully observe all the conditions and make such reports as are therein provided.

II.—RULES TO BE OBSERVED IN LOCATING AND CONSTRUCTING AERIAL AND UNDERGROUND CONDUCTORS.

Rule 1.—Conductors conveying currents having an E. M. F. of over 50 Volts, where carried through cities or closely settled localities, should in all cases be insulated.

Rule 2.—Conducting wires over buildings must be located at least seven feet above the roofs, and also high enough to avoid the ladders of the fire department.

Rule 3.—Conductors conveying currents for arc light or power, secondary distribution or the like, and when run parallel with telegraph or telephonic conductors, should in no case be nearer than ten feet where single, and six feet where double. By double is meant outgoing and return leads.

Rule 4.—Conducting wires must be secured to insulating fastenings and covered with an insulation which is water-proof on the outside and not easily worn by abrasion, and where wires are passed through walls, cornices or the like, should be protected as in Rule 11.

Rule 5.—Conductors carried along the exterior walls of buildings should in all cases be supported upon glass or porcelain insulators, placed at least ten inches apart, and so arranged as not to be liable to abrasion from cornices, metallic shutters and the like. Special means should be provided to prevent accumulation of ice upon such conductors.

Rule 6.—Conducting wires conveying currents such as employed in electric lighting and power, and which are in proximity to other wires, should be so secured or guarded as to prevent any possibility of contacts between the wires in case of accidents to the wires or their supports.

Rule 7.—All conductors carried underground should be encased in lead and preferably located in conduits made of a material which is non-porous to gas or water, non-inflammable and of good insulating character.

III.—RULES TO BE OBSERVED TO PREVENT ACCIDENTS TO LIFE.

Rule 1.—No work of any sort, kind or description should be done upon an electric circuit whereon the E. M. F. of the current flowing exceeds 50 Volts for alternating currents and 200 Volts for continuous currents.

Rule 2.—Where it is necessary to repair any portion of the line or fixtures, or lamps or other translating devices contained therein or thereon, and the current be flowing thereon, such portion of the line or fixture must first be cut out of circuit by means of a suitable cut-out, which should be in electrical connection with a visual or audible tell-tale device to show or make evident by sound, that no current is flowing on the line.

Rule 3.—Where bare conductors are employed for the transmission of power, they should rest upon the insulating supports, and be provided with an insulating covering for at least two feet each side of the insulating supports.

Rule 4.—Long lines having a number of arc lights in series should be provided with a shunt and a suitable cut-out switch around every five lamps.

Commissioner Gibbens offered the following resolution:

Resolved, That the rules and requirements of the New England Insurance Exchange for electric lighting by the incandescent system, adopted March 1st, 1888, printed in the Electrical Review, be printed in the minutes, for the convenience of members.

Unanimously adopted.

The following are the rules referred to:

RELATING TO INCANDESCENT LIGHTING.

The following rules and requirements of the New England Insurance Exchange for electric lighting by the incandescent system were adopted March 1, 1888, and supersede all previous rules:

OUTSIDE WIRES.

1. All outside overhead wires must be covered with some material of high insulating power, not easily abraded, and impervious to moisture; and they must be firmly secured to properly insulated and substantially built supports. All tie wires must be insulated the same as conducting wires.

2. All joints must be so made that a perfectly secure and unvarying connection, fully equal to the cross-section of the conducting wire, will be secured—and they should be soldered. All joints must be securely wrapped with at least five layers or ply of an approved tape.

3. Care must be taken that conducting wires are not placed in such position that it would be easy for water, or any liquid, to form cross-connection between them, and they should not approach each other nearer than one foot.

4. The wires must never be allowed to contact with any substance other than air, and their proper insulating supports.

5. Conducting wires carried over or attached to buildings, must be at least seven feet above the highest point of flat roofs, and one foot above the ridge of pitch roofs.

6. When they are in proximity to other conducting wires, or any substance likely to divert any portion of the current, dead, insulated guard-irons must be placed so as to prevent any possibility of contact in case of accident to the wires, or their supports. The same precautions must be taken where sharp angles occur in the line wires, and also where any wires (telegraph, telephone or others) could possibly, owing to their position, come in contact with the electric light wires.

7. Lines constructed subsequent to the adoption of these regulations should not be run over and attached to buildings other than those in which the light or power is being, or is to be used, but should be on separate poles, where they can be easily reached for inspection.

8. Overhead service wires from street mains to main cut-out inside of building, must be separated by a distance of not less than six inches, for currents having an electro-motive force of 130 volts or less, and this distance must be increased for currents of higher potential.

9. They must also be rigidly and neatly run, and must be supported by glass or porcelain insulators or by rubber hooks. Rubber hooks must be of an approved pattern; i. e., with the rubber insulation free from flaws, and projecting over the hook in cup form.

10. Service blocks must be protected by at least two coats of waterproof paint over their entire surface; and when used to support rubber hooks must have at least one inch of wood between the inner end of the hook and the back of the block.

11. For entering buildings, wires of extra heavy and durable waterproof insulation, protected by an outside covering not easily abraded, must be used from the terminal insulators outside, to the main cut-out inside of the building. They must loop down, so that water may drip off without entering the building, and the holes through which they enter must slant upward.

12. Service wires must come in contact with nothing save air and their insulating supports, except in unavoidable cases, when a wire with an extra heavy insulation, suitable for the purpose, must be used.

13. The use of porcelain knobs as insulators, except in perfectly dry places, or for the support of a specially insulated wire, will not be allowed.

UNDERGROUND SERVICES.

14. Where underground service conductors enclosed in a metal tube, enter a building, special care must be taken at the point where the conductors leave the tube, and thence to the main cut-out, to protect them in such a manner that they cannot come in contact with each other, nor with the tube, nor be acted upon by falling moisture, nor disturbed by anything being moved against them, etc.

15. This service must not end in any place where it would be unsafe or undesirable to place a cut-out, but should be continued by means of specially insulated conductors to a suitable location.

INSIDE WIRING.

16. Copper wire used for incandescent lighting must be procured from manufacturers whose products have been found, by reliable tests, to be at least 95 per cent. pure copper. Samples of wire to be used, or in actual use, must be submitted to this Exchange, for tests of conductivity, at any time when required.

17. Permission will not be granted for use of the lights unless the wire comes fully up to the standard of conductivity, no matter how well the wiring may be done.

18. All parties, firms or corporations proposing to do construction work or wiring, either outside or inside, must first satisfy this Exchange of their ability to do so in a safe and acceptable manner.

19. Before using any new forms of insulation for concealed work, the approval of this Exchange for its use under the proposed circumstances, must be secured.

20. "Underwriters' wire" must be used only in perfectly dry places, and places free from the vapors of ammonia, etc. It must be used only for cleared work, and must not be concealed.

21. Wires in moulding or concealed from sight within partitions, over ceilings, or in any other way, must have a special insulation, capable of resisting abrasion, durable, and waterproof.

22. When wires are run in new buildings, and are to be concealed from view by walls and ceilings, care must be taken to separate them ten inches or more, whenever it is possible to do so, by running them singly on separate timbers, studding, etc. Care must also be taken to keep the wires away from the gas pipes and other conductors. Outlet wires should be left in such a way as not to be injured by plasterers, and when brought through in connection with gas pipes, must be carefully insulated from them.

23. Moulding must not be used in wet places.

24. In dye houses, paper and pulp mills, or other buildings specially liable to moisture, all wires (except when used for pendants) must be separated at least six inches. The wire must have a durable waterproof covering, must be thoroughly and carefully put up and must be supported by glass or porcelain insulators, or by rubber hooks.

25. Wherever wires cross gas or water pipes, or other bare metal, or any other wire (except an arc-light wire), they should be separated from the same by some continuous non-conductor at least one-half inch thick. In wet places an air-space must be left between wires and pipes in crossing, and the former must be run in such a way that they cannot come in contact with the pipe accidentally.

26. Where wires pass through partitions, floors, etc., an outer sheathing of wood or hard rubber should be used to protect them.
27. Wires must never be left exposed to mechanical injury, or to disturbance of any kind.
28. Metallic staples must never be used to fasten wire.
29. Soft rubber tube will not be accepted as a durable waterproof insulation.
30. Wires of the same polarity but belonging to different circuits, or leading to and from a double-pole switch, must not run in one groove, through the same slot in a cleat, unless specially insulated.
31. Cleats should be made of well-seasoned hard wood, porcelain, or other approved material. When secured by cleats not over four feet apart and tightly stretched in the same horizontal plane, wires having a difference of potential of 120 volts or less, should be separated at least $1\frac{1}{2}$ inches; when they are confined in moulding, a half inch space is sufficient. This rule applies only to small mains, taps, etc.; large mains carrying strong currents should be separated a greater distance.
32. The dividing strip between grooves in moulding must never be cut out to admit joints in wires.
33. Where exposed to acid fumes, vapors of ammonia, etc., wires must, of course, be provided with an insulation that will not be injured thereby, and should be put up in the manner described in Rule 25.
34. All splices in wires must be soldered; a soldering bolt should be used for this purpose, if possible. Care must be taken not to render the wire brittle by overheating. Resin must not be used as a flux. Nothing stronger than a 10 per cent. acid solution should be used, and any excess should be washed off before the splice is covered.
35. The insulation of any joint must be equal to that of other parts of the same wire.

SAFETY CUT-OUTS AND SWITCHES.

36. Every part of the system of conductors must be protected by safety cut-outs that will interrupt the passage through any conductor of a current stronger than that conductor can safely carry. The carrying capacity (in amperes) of a fusible metal must be less than that of the smallest conductor it is designed to protect. Conductors, of course, include wire, cord, binding-screws, contact points of switches, sockets, cut-outs, etc.
37. A cut-out must be placed where the underground or overhead service joins the inside wires, and at every point where a change is made in the size of the wire (unless the cut-out in the larger wire be designed to protect the smaller).
38. Cut-outs, switches, and other devices which occasion a break in the insulation, must be so mounted that leakage of electricity from them is impossible; must not be put in places liable to become damp; must be protected from rubbish, etc., and should be easy of access.
39. Where it is necessary to use cut-outs and switches in damp places great care must be taken to protect them from moisture, and to use only such as are provided with bases that will not absorb moisture.

40. When necessary, cut-out connections must be covered with some fireproof and water-repelling material.
41. Cut-outs connected for carrying five amperes or more, must be double-pole.
42. The plug or other device for enclosing or supporting the fusible strip or wire must be incombustible and moisture-proof, and so constructed that an arc cannot be maintained across its terminals through the vaporizing of the fusible metal.
43. No lead or composition strips carrying fifty amperes or upwards before melting, must be used, unless provided with contact surfaces of some harder material having perfect electrical connection with the fusible part of the strip.
44. All switches must have a firm and secure contact that will make and break readily, and that will not stick between "full on" and "off," nor get out of repair easily in other ways. The points of contact must not be allowed to scrape or rub the entire surface of an insulating material between the contact strips; an air-space must intervene. The carrying capacity of the different parts must be sufficient to prevent heating.
45. Where points varying widely in potential are brought near each other by means of cut-outs, or switches, hard rubber, lava or other approved material must be used in the construction of the cut-outs and switches.
46. Switches carrying five amperes and upward should be double-pole, particularly when the circuits which they operate are connected to fixtures attached to gas-pipes.
47. On any one fixture, no group of lamps requiring a current of seven amperes or over must be ultimately dependent on one cut-out.

FIXTURE WORK.

48. In all cases where wires are concealed within, or attached to fixtures, the latter must be insulated from the gas-pipe, by some device approved by this Exchange. An exception to this rule will sometimes be made in the case of a gas bracket wired for one or two lights.
49. When holes are drilled in fixtures, all burrs or fins must be removed from the edge of the holes before the wires are drawn through.
50. When wired outside, the cord or wire used must be so secured as not to be cut or abraded by the pressure of its fastenings, or motion of the fixture.
51. All wire used for fixture work must have an insulation that is moisture-proof, durable, and not easily abraded.
52. Each fixture must be tested for possible "contact" between wire and fixture, and for "short circuit," before current is turned on.
53. The tendency to condensation within the pipes of fixtures should be guarded against, by sealing the upper end.

PENDANTS AND SOCKETS.

54. No portion of the lamp-socket exposed to contact with outside objects must be allowed to come into electrical connection with either of the conducting wires.

55. Cord pendants must be protected by hard rubber bushing, or something equally good, where they enter the socket.

56. The use of paraffined insulation for pendants will not be allowed.

57. Every pendant must be supplied with a ceiling cut-out, except in cases where it is necessary to use waterproof wire pendants (as in wet rooms) and to connect the same to the wires overhead by means of a splice.

58. Key sockets must not be used with wire pendants, unless the wire be composed of strands, i. e., flexible.

59. When exposed to weather, or used in wet rooms, care must be taken to keep moisture from the inside of sockets.

60. The weight of socket and lamp suspended by a cord should be borne by a knot within the ceiling cut-out, and by one under the bushing in the socket.

61. "Underwriters' wire" must not be used for pendants—when it is necessary to use ordinary, inflexible wire, it must have a special insulation.

62. Cord used for pendants should have four coverings, one of them composed of rubber or other moisture-proof material.

DYNAMOS AND MOTORS.

63. They must be located in dry places, not exposed to flyings of combustible material, and must be insulated upon dry, well varnished wooden foundations. They must be kept thoroughly clean and dry. In wiring for motive power, the same precaution should be taken as with a current of the same strength and potential for lighting. The motor (and resistance box) should be protected by a cut-out, and controlled by a switch.

SECONDARY GENERATORS OR CONVERTERS.

64. Converters must not be placed inside of any building. They may be placed on the outer walls when in plain sight and easy of access, but must be thoroughly insulated from them. If placed on wooden walls, or the wood-work of stone or brick buildings the insulation must be fireproof. When an underground service is used, the converter may be put in any convenient place that is dry, and does not open into the interior of the building—this location must have the approval of the inspector before the current is turned on.

65. The converter should be enclosed in a metallic or non-combustible case.

66. If, for any reason, it becomes necessary that the primary wires leading to and from the converter should enter a building, they must be kept apart a distance of not less than twelve inches, and the same distance from all other conducting bodies. The insulation of the wires must be of the very best.

67. Safety fuses should be placed in both the primary and secondary wires in the converter. Secondary wires after leaving the converter will be subject to rules already given for services, inside wiring, etc.

MISCELLANEOUS.

68. Companies or individuals furnishing electricity from central stations, must enter into an agreement with this Exchange binding themselves to maintain at all times in their station some approved device, to indicate instantly any escape to earth which may tend to develop leakages to water or gas-pipes, or other earth connections within buildings. This approved means of testing shall also apply to separate or isolated plants, where special conditions of moisture exist, or in buildings subject to mechanical changes of piping, etc.

69. The signing of these Rules and Requirements shall constitute, and be considered an agreement on the part of the signer, that such approved automatic device or tell-tale shall at all times be employed on their circuits.

70. The wiring in any building must test free from "grounds" before the current is turned on. This test may be made with a magneto that will ring through a resistance of 10,000 ohms, where currents of less than 200 volts potential are used.

71. All incandescent work should be inspected before the current is turned on.

72. The New England Insurance Exchange reserves the right at any time to add to, change, or modify these Rules, and to enforce such modifications, changes, etc., as it shall deem necessary for safety; and it will use all reasonable efforts to promptly notify all Electric Light Companies of any changes.

73. The Inspector's certificate must specify the kind, number and size of lamps which may be installed, or their equivalent in amperes. Any additional loading of wires, either in a building as a whole or in any department thereof without the previous approval of this Exchange, or the Inspector, shall be deemed a sufficient cause for the suspension of permits, until such approval is secured.

The Secretary read an application of the Mount Morris Electric Light Company "to erect not to exceed twenty-five carrying poles on Greenwich street, between Battery place and Franklin street, and poles on Washington and West streets, from Battery place to Franklin street, and to use existing poles on these streets, wherever possible, to make connection with station and city lights; and it is further stipulated that it will remove the carrying poles and occupy the subways, when perfected, on this route."

Commissioner Moss moved the following resolution:

Resolved, That the application of the Mount Morris Electric Light Company be granted.

Vote:—Commissioners Hess and Moss, "aye," Commissioner Gibbens, "no."

Commissioner Gibbens made the point of order that the motion was not carried, and President Hess overruled it.

The Secretary read another application of the Mount Morris Electric Light Company "To erect poles on 125th street, from Third avenue to the Grand Boulevard, on Sixth or Lenox avenue, from 110th to 136th street, on the Grand Boulevard, from 110th street to 155th street, and on Eighth avenue, from 122d to 125th street, and to use existing poles wherever possible, to make connection with station and city lights."

Commissioner Gibbens offered the following resolution :

Resolved, That the Board adjourn. Lost.

Vote:—Commissioner Gibbens, "aye," Commissioners Hess and Moss, "no."

Commissioner Gibbens asked to be excused and withdrew, whereupon Mayor Hewitt returned to his chair.

Mayor Hewitt said, in regard to the above applications, that the contracts for city lighting would expire in a few days, and as the matter of street lighting for the coming year was now before the Gas Commission, all such applications, including the one already voted on, might as well be laid on the table for the time being.

There being no objection, the Chair so ordered.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, May 10th, 1888, at 12 o'clock noon.

Present: Mayor Abram S. Hewitt, Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

Commissioner Gibbens moved that the reading of the minutes be dispensed with.

Mayor Hewitt stated that he should insist upon the reading of the minutes, for the reason that a communication from him, addressed to the Board, had been suppressed.

The Secretary then proceeded to read the minutes.

Mayor Hewitt, after stating that he objected to the approval of the minutes, containing a letter which makes an attack upon the Mayor, without having first printed his communication, offered the following resolution :

Resolved, That the resolution and statement, commencing at the bottom of page 18, be stricken from the minutes.

Lost—Commissioners Hess, Gibbens and Moss voting "no," Mayor Hewitt, "aye."

Commissioner Gibbens moved the following resolution :

Resolved, That the communication received from the Mayor be placed in the minutes of the last meeting, and that they then stand approved.

The following is the communication referred to in the foregoing resolution:

MAYOR'S OFFICE,

NEW YORK, Jan. 26, 1888.

THEODORE MOSS, Esq., Secretary:

SIR:—On the receipt of your letter enclosing the resolution of the Board of Electrical Control, asking the Mayor to instruct the Commissioner of Public Works to remove certain poles and wires therein specified, I transmitted your letter to the Commissioner for his opinion as to whether he could execute such an order if it were issued by the Mayor. I now enclose you a copy of his reply, by which it appears that he is without funds which could be expended on the work indicated. It does not seem proper for me to issue an order which could not be executed. He suggests that the Board of Estimate and Apportionment might divert specific appropriations to objects other than those originally named; but he does not suggest which appropriation could in this way be diverted, and I have no information which will enable me to make any such suggestion. I am constrained, therefore, by the necessities of the position, to decline, as at present advised, to issue the order requested by the Board of Electrical Control.

Yours respectfully,

ABRAM S. HEWITT, Mayor.

NEW YORK, Jan. 25, 1888.

HON. ABRAM S. HEWITT, Mayor:

SIR:—I had intended to have referred the matter of the removal of the poles and wires of certain Electric Companies to the Corporation Counsel, but the provisions contained in Section 3, Chapter 716 of the laws of 1887, are so explicit upon this subject that I consider it no longer necessary. The sole question, it appears to me, relates to the means provided for defraying the cost of these proceedings. As I have before reported to the Mayor, the removal of these poles and wires was not foreseen by this Department, and was not made the subject of any Departmental Estimate for the year 1888; so that at present I am without funds for any such purpose. The Board of Estimate and Apportionment has, in several instances, diverted specific appropriations to objects other than those originally named.

Very respectfully,

JOHN NEWTON, Commissioner of Public Works.

Adopted. Vote:—Commissioners Hess, Gibbens and Moss, "aye;" Mayor Hewitt, "no."

Mayor Hewitt here stated that he considered an insult had been leveled at the Mayor, and he thought that hereafter he would not attend any meetings of the Board. That he knew of no law compelling him to sit and act with officials who had not the instincts of gentlemen.

Mayor Hewitt thereupon withdrew from the meeting.

[MAY 10, 1888.]

The following communications from the Metropolitan Telephone and Telegraph Company, dated, respectively, April 16 and May 9, 1888, were ordered to be spread on the minutes.

OFFICE OF THE GENERAL MANAGER OF
THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.,
18 CORTLANDT STREET,
NEW YORK, April 16, 1888.

The Honorable Board of Electrical Control, 1218 Broadway, City:

GENTLEMEN:—For the information of your honorable Board, I beg to submit the following statement, showing the work performed by this Company in its endeavors to carry out the law for the removal of its poles and wires from the streets of New York.

Before submitting the statement, however, I would call your attention to certain facts in connection with our endeavors, which clearly show that the progress made by this Company in preparing to remove its wires, etc., has in reality been greater than would appear from a superficial view; and that this Company has, and is, carrying out the law as rapidly as possible, and in fact is, to all intents and purposes co-equal with, if not in advance of, the facilities furnished by your honorable Board for placing and connecting its wires underground.

You will readily understand that during the past winter, with the exception of placing our orders for underground cables, little or nothing could be done in the way of laying cables, or even making arrangements for connecting them up. The severe storm of March 12 also delayed our work very considerably, and even to-day we are not in the same condition as we were prior to the storm; many of our men being still engaged in restoring service to our subscribers whose lines were disabled or broken down.

In addition to this considerable difficulty is experienced in procuring competent men, familiar with the work, and men able to make proper cable splices.

Another source of delay has been caused by the gas in the man-holes of the underground subways, not only in New York, but in other cities. Besides the accident in this city which resulted in the death of one man and the disablement of the other for a considerable period, there was an accident in Buffalo by which we were deprived of the services of two of the best men in the business. These men were all splicers and fully competent. We have, therefore, been shorthanded in this part of the work. This delays us in completing cables already laid, and delays us in laying other cables, for the reason that we cannot well have more than five cables in a man-hole unspliced on account of the room taken up by the loose ends.

With these facts borne in mind, it will be readily seen that our progress has been rapid, and had the conditions been more propitious even greater progress could undoubtedly have been made.

So far as the removal of the poles of this Company is concerned, I am unable to add to the statement furnished your Honorable Board by our former Vice-President under date of December 21st, 1887, but we hope to be able to remove all our poles on

Fifty-eighth street, between Third and Sixth avenues, in a comparatively short time, as also the poles on the west side of First avenue from Fifty-eighth street to One Hundred and Sixth street.

Our objective point has been to lay and splice and prepare for connecting up when cable terminal facilities have been secured and completed a large amount of cable which, when completed, can be readily used at the one time, and to-day we have already in the ducts or being drawn in a very large amount of underground cable, as per the adjoined statement, all of which is respectfully submitted. The following cables had been laid up to December 31st, 1887:

3 cables from 21st street to 58th street.	
1 cable " 21st street to 27th street.	
1 " " 39th street to 42d street.	
1 " " 39th street to 58th street.	
1 " " 39th street to 45th street.	
Wire Mileage	760.152
	<hr/>
	1000

10 lengths from 18 Cortlandt street to Broadway.	
5 " " Broadway and Cortlandt street to Cedar street.	
5 " " Cedar street to Wall street.	
5 " " Cortlandt street to John street.	
Wire Mileage	176.705
Or a Grand Total of (miles)	936.857

Since that date the following report will show what has been done in the way of underground cable work.

ON CHURCH STREET.

1 cable from 18 Cortlandt street to Spring street (mileage)	124.753
	1000
1 cable " " " " to Spring street Exchange	142.007
	1000
	<hr/>
	266.760
	<hr/>
	1000

SIXTH AVENUE.

1 cable from 9th street man-hole to 58th street man-hole	249.621
1 " " 39th Street Exchange to 51st street	71.771
	<hr/>
	588.152

FIFTY-EIGHTH STREET.

5 cables on 58th street and 6th avenue to 2d man-hole.....	49.621
2 " " " " " to 2d to 4th man-hole.....	16.894
3 " " " " " to 4th to 6th man-hole.....	30.965
2 " " " " " to 6th to 4th avenue man-hole.....	21.515
1 cable " " " " " to 7th to 10th man-hole on 3d av.....	24.280
	<hr/>
	731.427

UP BROADWAY CABLE.

2 cables from 18 Cortlandt street to cor. Cortlandt street.....	10.227
3 " " " " " to John street man-hole.....	37.689
	<hr/>
	779.343
	<hr/>
	1000

DOWN BROADWAY CABLES.

5 cables from 18 Cortlandt street to Cedar street man-hole.....	68.504
12 " on Broadway and Wall street to Exchange place.....	95.454
4 " from Broadway and Morris street to Bowling Green.....	22.576
5 " from Bowling Green to State street.....	24.337
6 " from State street to Stone street.....	41.135
3 " from Stone street to Pearl street.....	18.693
6 " from Broadway in Exchange place to Broad street.....	41.818
6 " on Broad street from Exchange place to 3d man-hole.....	31.490
	<hr/>
Grand Total	1,123.350
	<hr/>
	1000

(One thousand one hundred and twenty-three and one-third miles of conductors.)

Wire mileage Dec. 31st, 1887.....	936.857
Wire mileage since Dec. 31, 1887.....	1,123.350

Or a grand total of..... 2,060.207

All the above cables have actually been laid, but all have not yet been spliced. The splicing is, however, proceeding as rapidly as possible, as well as the laying of other cables.

I need scarcely add that the underground work is being pushed as rapidly as possible, not only in purchasing and laying the cables, but also that of obtaining terminal facilities, etc., etc.

Trusting that the statements above made are satisfactory to your honorable Board in every particular.

I am, respectfully,

W. H. ECKERT, Genl. Manager.

EXECUTIVE OFFICES OF
THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.,
18 CORTLANDT STREET, NEW YORK, May 9th, 1888.

To the Honorable the Board of Electrical Control:

GENTLEMEN:—In compliance with your request, I beg to make the following statement in regard to the work done by this company in the way of placing its wires in the subways of this city.

All the wires on the pole line on Sixth avenue, between Twenty-first street and Fifty-eighth street have been taken down, and the poles between the above-mentioned points (which belong to another company) can be taken down by their owners, with the exception of one pole at the northeast corner of Twenty-first street and Sixth avenue, one pole at the northeast corner of Forty-second street and Sixth avenue, and one at the northwest corner of Forty-second street and Sixth avenue. I am informed, however, that there are still a few fire alarm wires on this pole line.

The wires on the pole line on Fifty-eighth street, between Sixth and Third avenues, are now being placed in the subways in that street as rapidly as possible, and we expect to have all the wires off the poles within the next fortnight. These poles can be taken down just as soon as the Fire Department has removed its wires, of which they have some 27 between Fifth and Sixth avenues.

The pole line on the west side of First avenue, between Fifty-eighth street and One Hundred and Sixth street, will be taken down just as soon as we complete the work on Fifty-eighth street, between Third and Sixth avenues.

The work of drawing the cables in the subways is progressing very satisfactorily, and we have already placed in the underground system some 2,688 miles of wire in cables, and the work of splicing the cables is being done rapidly.

We have arranged to put all our housetop wires in the very best possible shape by placing them in small cables and running them down the walls and courts of buildings, and clearing away as many as possible of the single wires, which are unsightly, and, in short, are making, as far as possible, the work presentable, until such time as they can be put underground.

In the present system of distributing telephone wires by overhead distribution, both separate wires and wires in cables are brought from poles to buildings, and from housetop fixtures are carried to subscribers. While many wires are necessarily used in such a way as to be visible under the arrangement, it must not be thought that the bulk of the wires that appear are solely due to the use of the telephone, for a great and increasing number of separate wires are necessitated by the connections of the district messenger service, burglar alarm systems and others.

As far as our service is concerned, we propose, as rapidly as possible, to substitute for the above system one which will enable the wires to be taken underground from the nearest subways by one of two methods. The first is, direct to the cellar of a building, and thence to subscribers in that building by means of an iron pipe connecting underground with the distribution boxes of the subway.

The second is by bringing the wires or cables through an iron pipe from the nearest man-hole underground into the elevator or ventilating shafts, or sometimes to a

recess or angle in the front of a building, whence the wires or cables ascend to the roof, enclosed in an iron pipe for protection, and from the roof fixtures the separate wires will be distributed to different buildings and subscribers in that block.

The success of this last arrangement depends to a great extent upon our being able to make satisfactory arrangements with the landlords and owners of buildings as to the privilege of entering.

The owners of buildings, while desiring in common with the general public to see the wires underground, are not always willing to take a share in assisting in the accomplishment of this object, and are in a position to thwart our best efforts to carry out the above-mentioned plan.

We shall use our best endeavors to make the connections as rapidly as the subways progress, and, although during the period of transition while this work is going on, there will not be much visible diminution of overhead wires, it will still result, within a reasonable length of time, in greatly reducing these wires and in furthering the object which your Board have in view.

As fast as these connections are completed underground we will remove the overhead wires and clear up the streets.

Respectfully,

W. H. ECKERT, General Manager.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Committee on Lampposts be discharged.

That all permits of the Board not acted upon be, and the same are hereby revoked.

That the Rules and Regulations of the Board be amended so as to read as follows:

RULES AND REGULATIONS FOR OVERHEAD WIRES.

- I. Electrical conductors are divided into two classes.
 - (1.) Those for telegraph, telephone, and similar service.
 - (2.) Those for electric light and power, and similar service.
- II. No two lines of poles bearing conductors of a like class shall be erected on any street or avenue.
- III. No two lines of poles shall be erected on the same side of any street or avenue.
- IV. All conductors of the second class shall be secured to insulating fastenings, and covered with an insulation which is waterproof on the outside and not easily worn by abrasion. Whenever the insulation becomes impaired it must be renewed immediately.
- V. Poles shall be placed upon the sidewalk, as near the curb as possible, and no pole shall be placed within ten feet of any lamp-post or other pole.

VI. All existing regulations of the local authorities in regard to the placing of poles and stringing of wires are to continue in force, and the rules and regulations of the New York Board of Fire Underwriters must be strictly observed.

VII. All wires shall be fastened upon poles or other fixtures with glass, porcelain or rubber insulators.

VIII. No wires of the second class shall be stretched within one foot of any pole without being attached to the same with glass, porcelain or rubber insulation.

IX. No wires of the second class shall be stretched within twelve feet of the ground or within two feet of any building, except when attached thereto with glass, rubber or porcelain insulators.

X. No electrical conductors shall be stretched over any part of any house or other building, or attached thereto, except by permission of the owner thereof, and all conducting wires of the second class must be at least seven feet above roofs, and placed so as to avoid ladders of the Fire Department and shutters.

XI. The companies or persons owning or controlling poles in any street or avenue shall allow the same to be used by other companies or persons operating conductors for similar electrical service when authorized so to do by the Board, on tender of proper compensation, to be determined by agreement between the parties interested. In default of such an agreement the amount of such compensation shall be determined by the Board. This rule imports a contract on the part of each company or person owning or controlling the poles in any street or avenue, not only with the Board, but also with each company or person who shall under its terms be qualified to demand the privileges it confers.

XII. All permits of the Board for overhead wires and fixtures are granted only pending the providing of underground accommodations in the neighborhood of the street or avenue for which the permit is granted.

XIII. Any member or officer of the Board, and every inspector employed by it, as well as every member of the police force of the city, shall be entitled to examine permits under which work of any kind is being done.

XIV. No permit shall be granted for the erection of any overhead structure nor for the renewing of any lines already existing in any street, avenue or highway in which underground accommodations for the service have been provided, or are being provided.

XV. All poles now standing, or to be hereafter erected, shall be branded or stamped with the initials of the company owning them, at a point not less than five or more than seven feet from the street surface.

When an old pole is taken down it must be removed from the street the same day.

New poles must not be brought upon any street more than two days in advance of their erection.

Any pole that shall lie on any street more than two days shall be removed by the Bureau of Incumbrances of the Department of Public Works, at the expense of the party owning it.

XVI. All electrical companies or persons having poles in the public streets shall give a bond to the city in a reasonable amount, to be determined in each case by the Board, conditioned for the payment of the cost of removing dangerous and abandoned poles, and also for the payment of the expense of restoring the sidewalks and pavements where the same have been disturbed or injured in consequence of the erection or removal of any pole owned by them.

XVII. The violation of any of the rules and regulations of the Board, shall operate ipso facto by a revocation of the permit held by the company or person guilty of such violation.

XVIII. Whenever hereafter any company shall be permitted by this Board, or its successors, to erect posts or poles, or other fixtures bearing lamps or other devices for the purpose of lighting, by electricity, the streets, avenues, highways, parks or public places of the city, the said permission shall be granted only subject to the following provisions, and the same is hereby expressly made a condition of said permits:

At any time when, by action of the city authorities, the contract for lighting any such street or other public place shall be given to another company, the company erecting said lighting fixtures or lamp-posts shall, on tender of the first cost thereof, yield possession and ownership of the same to the said other company obtaining the new contract.

XIX. Electric light lamp-posts shall be in accordance with the plan adopted by the Board.

XX. All broken and "dead" wires, and all wires, poles, and fixtures not actually in use, must be removed from the streets, avenues and highways of the city.

PERMITS.

XXI. The general permit giving electrical companies the right to repair their lines of conductors where needed is continued and made obligatory upon said companies.

This general permit does not, however, cover the erection in any street, avenue or highway of any new poles or other similar fixtures, and has absolutely no reference whatever to lines which have been ordered underground by the Board, and which the Mayor has been requested to remove.

In the case of such lines, where notice has been given that underground accommodations have been provided, and the ninety days of notice required by law have elapsed, and the Mayor has been requested to remove the same, companies owning or operating said lines are not authorized to make any repairs or connections or to go upon the poles bearing such lines for any purpose whatever, except to remove the said lines of electrical conductors in conformity with the directions of the Board.

Any deviation from this rule requires a resolution passed at a regular meeting of the Board, attested by the Secretary.

XXII. The Secretary is authorized to issue to companies operating electrical conductors of the first class, all permits required by them for the making of connections necessary to the business of said companies with lines now in use, and which the Mayor has not been requested to remove, not including the erection of any new poles or similar fixtures—said connections to be in every case in accordance with the Rules and Regulations of the Board.

XXIII. No poles, lamp-posts or other similar fixtures shall hereafter be erected in any street, avenue or highway, except upon resolution passed at a regular meeting of the Board, attested by the Secretary.

XXIV. No conductors of the second class shall hereafter be placed above or under any street, avenue or highway, except upon a resolution of the Board, passed at a regular meeting, attested by the Secretary.

XXV. No applications for permits for the erection of poles or the placing of wires of the second class, will in any case be considered by the Board, when made by companies owning or operating electrical conductors in violation of these rules and regulations or in defiance of any order of this Board.

XXVI. These Rules and Regulations are subject to revision and alteration at any meeting of the Board.

Resolved, That the Secretary is directed to furnish a copy of the rules and regulations, as above, to each Electrical Company, and to furnish copies to the Mayor, Corporation Counsel, District Attorney, Heads of the Police Department, and to request the co-operation of these officials in the enforcement of the same.

The Secretary is also directed to notify the corporations whose lines of conductors the Mayor has been requested to remove, that in default of the carrying out of its request by the local authorities, the Board will endeavor to prevent the operation of such lines of conductors by all proper means in its power, until such time as said corporations shall satisfy the Board of their intention of converting said lines to an underground system.

Resolved, That the accompanying rules, regulations and information as to the same now enforced by the New York Board of Underwriters, the New England Board of Underwriters and the authorities of the City of Chicago and the City of London, be spread upon the minutes for the information of members of the Board.

Resolved, That the Secretary be directed to communicate with the Police and Fire Departments of the city with reference to the placing underground of their conductors on streets and avenues where subways have been provided for the same in accordance with law, and to lay before the Board the information required, also to request that the conductors placed in the streets for purpose of testing systems of Police signalling be removed as soon as possible and convenient to the purposes of the Commissioners of Police.

Unanimously adopted.

"Rules, regulations and information" referred to in resolution above:

NEW YORK BOARD OF FIRE UNDERWRITERS.

The following Standard for Electric Equipments was adopted by the New York Board of Fire Underwriters January 12th, 1882, and amended October 15th, 1884, and February 18th, 1885:

CAPACITY OF CONDUCTORS.

Fork Arc Lights.—The conductor must have a weight per running foot at least equal to that of the wire (or parallel group of wires), constituting the main circuit of the magnetic regulator of the electric lamps, or of the armature of the machine employed, whichever of these is the largest.

For Incandescent Lights.—Wherever a connection is made between a larger and a smaller conductor at the entrance to or within a building, some approved automatic device must be introduced in the circuit of the smaller conductor, whereby it shall be interrupted whenever the current passing through it is in excess of its safe carrying capacity.

The safe carrying capacity of a wire is that current which it will convey without becoming painfully warm when grasped in the closed hand.

INSULATION.

All wires, machines and lamps to be so mounted and secured as to insure complete and continuous insulation, with the exception of those parts (such as portions of the lamps or machines, for example), where insulation is impossible, and in this case accidental contact with exterior objects must be prevented by appropriate screens or the like.

In no case must "ground circuits" be employed, or any portion of the system be allowed to come into conducting connection with the earth through water or gas pipes, or otherwise.

Exposed wires must be covered with at least two coatings, one of insulating material next the wire, of a thickness and material approved by the Board, and another outside of this, of a material calculated to protect the former from abrasion or other mechanical injury.

Where there is a possible exposure to water, the first or second coating must be impervious to the fluid.

Wherever electricity is carried into a building by conductors from an exterior source, a "cut out" must be provided at a point as near as possible to the entrance to such building.

The outgoing and returning wires for Arc Lights should enter and leave each building at points at least one foot from each other.

The wires passing through the exterior walls of a building should be firmly encased in substantial tubes of non-conducting material, not liable to absorb moisture, and placed in such a manner as to prevent rain water from entering the building along the wire.

In running along walls and the like, wires should be rigidly attached to the same by non-conducting fastenings—the wires themselves being well insulated—and should not be hung from projecting insulators in loose loops.

All wires should be placed at a distance of eight inches for Arc Lights, and two and one-half inches for Incandescent Lights from each other, and wherever they approach any other wire or conducting body capable of furnishing another circuit or

ground connection they must be rigidly secured and separated from the same by some continuous solid non-conductor, such as dry wood, of at least one-half inch in thickness.

For incandescent lamp fixtures and electroliers, exceptions may be made to the foregoing rule in which the wires can be placed nearer than the above prescribed distance to each other, or to other conductors, provided the fixture is fully insulated at the base from the house and ground piping, and further provided that a double pole safety catch is placed at the base of each fixture, or at the nearest branch connection, as may be required by the Inspector of the Board.

In all cases when combination—gas and electric—fixtures are used, extra precaution must be used to secure complete and continuous insulation from the gas piping.

Wherever wires are carried through walls, floors or partitions in buildings, they must be surrounded by a special insulating tube of substantial material.

All joints in wires must be made in such a manner as to secure a perfect and durable contact. Continuous wires, without joints, to be used as far as possible.

GLOBES.

Arc Lights must be protected by glass globes, enclosed at the bottom to prevent the fall of ignited particles, and where inflammable materials are present below the lamps a wire netting must be added to keep the parts of the globe in place in case of its fracture during use.

All broken and cracked globes to be at once replaced by perfect globes.

In show windows and other places where inflammable materials are near the lights, spark arrestors shall be placed at the top of the globes.

AUTOMATIC SHUNT.

Wherever a current of such high electro-motive force is employed that, if concentrated on one lamp of the series, it would produce an arc capable of destroying or fusing parts of such lamp, an automatic switch must be introduced in each lamp by which it will be thrown out of circuit before the arc approaches any such dangerous extent.

Companies furnishing electricity from central stations must enter into an agreement with the New York Board of Fire Underwriters, binding themselves to test their lines for ground connections at least once every day—and preferable three times per day—and to report the result of such tests to the Board weekly.

Means by which those in charge of the dynamo electric machines will be warned of any excessive flow of current, or means whereby the same will be automatically checked, must in all cases be provided.

SWITCHES AND CUT OUTS.

All switches and cut outs, which shift, break or transmit a current, shall be so arranged as to close one circuit before opening the other, and must be mounted on an incombustible base.

MOTORS.

The Rules and Regulations under the head of capacity of wires, insulation, automatic cut outs and switches, shall be observed where electric motors are used, and in addition the motor frames must be properly insulated, and so mounted as to be free from grounds, and each motor should be provided with an approved switch to prevent an excessive flow of current.

STORAGE BATTERIES.

When the current for lights or power is taken from storage batteries the same general regulations are to be observed.

RULES AND REQUIREMENTS OF THE NEW ENGLAND INSURANCE
EXCHANGE FOR ELECTRIC LIGHTING BY THE INCANDESCENT SYSTEM.

(Adopted Sept. 15, 1885.)

DYNAMO MACHINES.

Dynamos must be located in dry places, not exposed to flyings of combustible material; they must be insulated upon wooden foundations, and kept thoroughly clean and dry.

TESTING.

Companies or individuals furnishing electricity from central stations must enter into an agreement with this Exchange binding themselves to maintain at all times, in their station, some approved device to act as an automatic "tell-tale," indicating instantly any "escape" to earth tending to seriously impair the insulation of the system or affect the working of the lamps, or to develop leakings to water, steam or gas pipes, or other metallic earth connections within the walls of buildings.

This approved means of testing shall also apply to separate or isolated plants where special conditions of moisture exist, or in buildings subject to mechanical changes of piping, etc.

The signing of these rules and requirements shall constitute and be considered an agreement on the part of the signer that such approved automatic device or "tell-tale" shall at all times be employed on their circuits.

WIRES AND INSULATION.

Copper wire used for incandescent lighting must be procured from manufacturers whose products have been found, by reliable tests, to be at least 95 per cent. pure copper. Samples of wire to be used, now in actual use, must be submitted at any time when required, to this Exchange, for tests of conductivity. Permission will not be granted for the use of the lights unless the wire comes fully up to the standard of conductivity, no matter how well the wiring may be done. All parties, firms or corporations proposing to do construction work or wiring, either outside or inside,

should, in order to secure the ultimate approval of their work, first satisfy this Exchange of their ability to do so in a safe and acceptable manner. They will then be supplied (if they desire it) with Cards giving samples of approved insulation and a statement of conditions under which each sample may be used. Before using any new forms of insulation for concealed work, the approval of this Exchange for its use under the proposed circumstances must be secured.

All connections except those made in cut outs, switches and sockets, must be soldered. For soldering, the use of ten per cent. acid solution as a flux, and a copper soldering bolt, are to be preferred when possible. Rosin must not be used as a flux, under any circumstances. Any excess of acid should be thoroughly cleansed from the wire.

Where it is feasible or necessary, cut-out connections must be covered with some fire-proof and water-repelling material, in order that the opportunities for corrosion and leakage may be reduced to the lowest possible degree.

The Inspector's certificate must specify the kind, number and size of lamps which may be installed, or their equivalent in amperes. Any additional loading of wires, either in a building as a whole or in any department thereof, without the previous approval of this Exchange or the Inspector, shall be deemed a sufficient cause for the suspension of permits until such approval is secured. (See certificate. Form F.)

CLEATS AND MOULDINGS.

Cleats should be made of well-seasoned hard wood, porcelain or other approved material. Wood-fibre cleats may be used when single wires are well separated, so that intervening insulating means can be depended on.

When cleats are placed upon brick or stone walls, a "back-board" of at least seven-eighths of an inch thickness of wood, thoroughly filled with shellac, asphaltum, varnish, or other equally effective insulator and repellant, or a specially insulated wire, will be insisted upon.

When secured by cleats not over four feet apart, and tightly stretched in the same horizontal plane, wires having a difference of potential of 150 volts or less should be separated at least one inch; where the pressure exceeds 150 volts they should be two inches apart; where they are confined in mouldings in thoroughly dry places, one-half this space is sufficient.

In stables, dye houses, paper and pulp mills, or other buildings specially liable to the condensation of moisture, all wires carrying one ampere and upward (excepting those within the pipes of the fixtures) should be separated at least six inches; and where vapors of ammonia or other corroding gases are liable to arise, they should be separated by a still wider space. The placing of two wires of opposite polarity (or of the same polarity when on separate switches) close together, will not be approved. In all places of this class, painted cotton insulation is prohibited, and some thoroughly water-proof covering, such as rubber, must be employed. The wires must be supported on glass or porcelain insulators. This wiring must show an insulation resistance between the ground and circuits of one Meg-ohm.

FIXTURE WORK.

In all cases where wires are concealed within fixtures, the latter should be insulated from the gas-piping by some suitable device approved by this Exchange. Special care should be taken to leave no sharp points or projections that would abrade the insulation. Where the holes are drilled in the fixtures, all burrs or fins left at the edges of the holes by the drill should be carefully removed before the wire is drawn through. When wired outside, special insulation and approved fastenings are required, with rubber covering, so secured as not to be abraded by the pressure of the fastenings or motion of the fixture.

Each fixture must be separately tested before introducing a current.

When fixtures are used for both gas and electricity, the insulation from the gas system at the top must be supplemented by careful insulation of the electric attachments from the body of the fixture.

No portion of the lamp-socket exposed to contact with outside objects must be allowed to come into electrical connection with either of the conducting wires.

Inside fixture wiring introducing over 150 volts, E. M. F., must be of special insulation approved by this Exchange.

The tendency to condensation within the pipes of fixtures must be guarded against by sealing the upper end.

SAFETY CUT-OUTS AND SWITCHES.

These, as well as all other devices, which occasion a break in the insulation, should be placed, when possible, in a perpendicular position; out of the way of direct currents of air; above basements and cellars which are liable to become seriously damp; and when concealed within the walls of buildings they must be easily accessible for inspection, by means of pockets.

Cut-outs and switches, when connected for carrying currents of five amperes and upwards, must be double-pole. The "plug" or other device for enclosing the fusible wire or strip, must be incombustible and moisture-proof, and constructed in a way that its terminals will be so far apart that an arc could not be supported through the vaporizing of the fusible material by the E. M. F. employed.

No lead or composition strips carrying fifty amperes or upward before melting, must be used, unless provided with plated contact surfaces, or ends of some harder material, having a perfect electrical connection with the fusible portion of the strip.

Cut outs should be placed near the points where all underground service tubes, or overhead lines, join the inside wires, and also at or near every joint where the size of the wire changes. No group of lamps requiring over seven amperes of current should be ultimately dependent upon one fusible wire or strip; and in large fixtures a strict adherence to this rule will be insisted on.

The carrying capacity (in amperes) of a fusible wire must be less than that of the smallest wire it is designed to protect.

Cut-outs or switches constructed of wood-fibre will not be approved; nor will wooden cut-outs and switches soaked in paraffine be approved for hot or moist places.

Where points varying widely in potential are brought near to each other by means of cut-outs or switches, hard rubber, lava or other approved material must be used in the construction of the cut-outs or switches.

LAMPS AND SOCKETS.

Lamps must not, under any circumstances, be partially unscrewed from the socket for the purpose of putting them out—some other provision must be made for that purpose.

Key sockets for pendant lamps supported by flexible cords are undesirable, unless provided with a non-conducting tube, firmly fixed to the socket, and not less than four inches long, which may be used as a handle.

The use of paraffine covered wire or cable, as pendants for lamps, will not be approved.

Flexible or other wires used as pendants must be protected by hard rubber bushings, or some equally efficient material, where they enter the sockets.

All flexible cords must be insulated; first by winding the small conductors with silk or cotton; then with a moisture-proof layer, such as rubber; then with a braid of silk, or some other covering, to prevent abrasion.

MISCELLANEOUS.

Cut-out switches, etc., when used in dye-houses, paper-mills and other damp places, should be protected, as far as possible, from moisture, and will be subject to approval or disapproval by the Inspector. Wires run in mouldings in damp places will not be approved.

All switches carrying over five amperes should be double-poled and have a firm and secure contact; they should make and break contact quickly. The points of contact should not be allowed to scrape or rub across the entire surface of the insulating material between the contact strips—an air space should intervene.

Wires of the same polarity must not be run under any single cleat, through the same tubing in walls, nor in or under one groove in mouldings, unless especially insulated.

The contact surfaces of all plugs, strips, or other devices intended for the protection of branch circuits, must be brightened, and the contact must be firm, with no chance of its becoming loose.

SAFETY REGULATIONS.

RULES OF THE BOSTON UNDERWRITERS' UNION.*

ARC LIGHT WIRES.

Conducting wires must be seven feet above roofs, and placed so as to avoid ladders of the fire department and fire shutters.

Whenever electric light wires are in proximity to other wires, dead guard wires must be placed so as to prevent any possibility of contact with foreign wires, in case

*Approved, November 1, 1887.

of accident to the wires or their supports. Conducting wires must be secured to insulating fastenings, and covered with an insulation which is waterproof on the outside and not easily worn by abrasion. Whenever wires pass through walls, roofs, floors or partitions, or there is liability to moisture, abrasion or exposure to rats or mice, the insulation must be protected with rubber, stoneware or some other satisfactory material. Wires entering buildings must be wrapped with tape and bent in such a manner that it will prevent the water entering the building. All wires passing over or under steam, gas or water pipes must have a good insulation between them and the pipes. Blocks of wood are the most desirable. This rule also applies to foreign wires—they should be treated the same as pipes.

Wires should go over water pipes, where it is possible, so that the moisture will not settle on the wires.

Hard rubber hooks are not desirable as fastenings, and tacks or staples must in no case be used for fastenings or brought in contact with the wire.

In damp places, wires must be run on glass insulators, and kept entirely clear from contact with inflammable material and any substance likely to make a ground connection.

The use of lead covered wires, or wires whose covering contains paraffine, is prohibited.

The use of underwriters' wire will not be passed where it is concealed in any manner. It must be in plain sight, on the walls or ceilings. Wire that is covered with molding must have water-proof insulation that is approved by this union.

Joints in wires to be securely made and wrapped with tape; soldered joints are desirable but not essential. Wires conducting electricity for arc lights must not approach each other nearer than one foot.

Care must be taken that the wires are not placed above each other in such a manner that water could make a cross connection.

Cut-off boxes for arc lights must have the words "On" and "Off" marked on them. They must be placed in a well-protected and accessible place, so that they can be operated by the firemen or police.

ARC LAMPS.

For arc lamps, the frames and other exposed parts of the lamps must be insulated from the circuit. Each lamp must be provided with a separate hand-switch, and also with an automatic switch, which will close the circuit and put the lamp out whenever the carbons do not approach each other, or the resistance of the lamp becomes excessive from any cause. The lamps must be provided with some arrangement or device to prevent the lower carbons from falling out, in case the clamp should not hold them securely.

For inside use, the light must be surrounded by a globe, which must rest in a tight stand, so that no particles of melted copper or heated carbon can escape; and when near combustible material, this globe must be protected by a wire netting. Broken or cracked globes must be replaced immediately. Unless a very high globe is used, which closes in as far as possible at the top, it must be covered by some protector, reaching to a safe distance above the light.

INCANDESCENT WIRES.

Conducting wires must be seven feet above roofs, and placed so as to avoid ladders of the fire department and fire shutters. All connections must be soldered and wrapped with tape.

Whenever the electric light wires are in proximity to other wires, dead guard wires must be placed so as to prevent any possibility of contact with foreign wires, in case of accident to the wires or their supports. Conducting wires must be secured to insulating fastenings, and covered with an insulation which is waterproof on the outside and not easily worn by abrasion. Whenever wires pass through walls, roofs, floors or partitions, or there is liability to moisture, abrasion, or exposure to rats and mice, the insulation must be protected with rubber, stoneware or some other satisfactory material. Wires entering buildings must be wrapped with tape, and bent in such a manner that it will prevent the water entering the building. All wires passing over or under steam, gas or water pipes must have a good insulation between them. Blocks of wood are the most desirable. This rule also applies to foreign wires—they should be treated the same as pipes.

Soft rubber tube is not desirable as an insulator.

Wires should go over water pipes, where it is possible, so that the moisture will not settle on the wires.

Where incandescent wires enter buildings they must have double-poled safety catches as near the entrance as possible.

The main wires must not be less than two and a half inches apart, except where they are in grooves.

The use of lead covered or wires whose covering contains paraffine is prohibited.

All wires that are fished over the ceiling or in the walls must have a waterproof insulation satisfactory to this union. This rule also applies to wires covered with molding, or concealed in any manner.

Where underwriters' wire is used, it must be in plain sight on the walls or ceilings.

Care must be taken that the wires are not placed above each other in such a manner that water could make a cross connection.

Wires that are run in damp places must be run on glass or porcelain insulators of suitable form.

For incandescent lamps, the conducting wires leading to each building, and to each important branch circuit, must be provided with an automatic switch or cut-off, or its equivalent, capable of protecting the system from any injury due to an excessive current of electricity. Those devices must be proportioned to protect the smallest wire in the loop to which they are attached.

On all loops of incandescent circuits, safety catches must be used on both sides of the loop, and switches on such loops should be double-poled.

Ceiling blocks that are used on pendant drops must have safety metals in them where flexible cord is used. Cord should have a knot tied in it with the knot on the

top side of the block, so that the strain will come on the knot instead of on the connection; and, where it is possible, a knot should be inside of the socket, the same as the block.

The small wires leading to each lamp from the main wires must be thoroughly insulated, and if separated or broken, no attempt made to join them while the current is in the main wires.

When wires are put on gas fixtures, the fixture must be isolated from the main pipe, and the insulator used for this purpose must be made so that the sediment in the gas will not form a connection over the insulating material.

Chandeliers or brackets attached to any ground connection must have insulating yokes or couplings on them. Individual insulating of lamps at the sockets will not be passed except on brackets in special cases that may be approved by the inspector.

DYNAMO MACHINES.

Dynamo machines must be located in dry places, not exposed to flyings or easily combustible material, and insulated upon wooden foundations. They must be provided with devices capable of controlling any changes in the quantity of current; and if these governors are not automatic, a competent person must be in attendance near the machine whenever it is in operation.

Each machine must be used with complete wire circuit; and connections of wires with pipes, or the use of ground circuits in any other method, are absolutely prohibited.

The whole system must be kept insulated, and tested every day with a magneto for ground connections in ample time before lighting, to remedy faults of insulation, if they are discovered; and proper testing apparatus must in each case be provided. This applies to both central station and isolated plants.

Testing circuits for grounds with a battery and bell is not considered a reliable test.

Preference is given for switches constructed with a lapping connection, so that no electric arc can be formed at the switch when it is changed; otherwise the stands of switches, where powerful currents are used, must be made of some incombustible substance which will withstand the heat of the arc when the switch is changed.

MOTORS.

Wires for motors should be run exactly as for lamps on similar circuits. On low tension circuits where motors are run in multiple, safety catches must be used on each side of the circuit.

On high tension circuits the same restrictions apply as for arc lamps, and suitable cut-offs must be provided.

Motors must be treated as dynamos as regards insulation, flyings, dampness, etc.

While these rules are intended to be complete, some cases may arise where, in the judgment of the inspector, some deviation from them may be necessary in order to secure safety.

RULES FOR RUNNING INCANDESCENT CIRCUITS FROM ALTERNATING MACHINES.

Outside wires should be treated as arc light wires; inside wires the same as incandescent circuits. Converters on alternating circuits must be outside of buildings, and must be placed high enough from the roof to prevent possible injury to firemen.

RULES TO APPLY TO THE RUNNING OF INCANDESCENT CIRCUITS WORKED FROM ARC CIRCUITS.

The running of incandescent lights or systems on arc circuits should be avoided; but wherever this is unavoidable, a proper device or distributor, such as may be approved by this union, must be provided to prevent the possibility of an excessive arc current being thrown on to any one portion of the incandescent system; such device or distributor must have the approval of this union before it is put in operation. It must remain open to inspection at all times, and no change made in any part of the installation after it has been approved, without the consent of this union.

Only such wire as has been approved by this union shall be used in constructing lines and circuits.

Wires must be run in plain sight. In damp places they must have a waterproof covering.

The positive wire or wires must be kept at least two and a half inches from the negative wire or wires in running from the distributor or regulator, to the fixtures and lamps, and return; except "twin wire" may be used for a single lamp.

No wires should be run through partitions, floors or walls, without being incased in a tube of hard rubber, porcelain, or covered with tape. Soft rubber tube is not desirable as an insulator.

The safety fuses must be so proportioned that they will melt long before the wire is heated to an unsafe degree.

Dust must not be allowed in the distributor box or any of the electrical connections.

The contact points should be kept clean, and care should be taken to insure solid electrical connections at all points of contact, and all parts must be kept free to move easily.

In case any defect should arise in the distributor or regulator, or the wiring thereto, it must be arranged so as to automatically and absolutely shunt off from the arc circuit at once.

In working distributors, the line or circuit current must be kept at its standard amount by tests made by ampere meter, from time to time. In no case must the amount exceed the standard.

Every company shall have a competent and reliable person to examine, daily, every distributor and regulator, or similar device which may in the future be applied to arc circuits.

Where incandescent lights are run on arc circuits, the following named practices are strictly prohibited:

Fastening or attaching electroliers, or lamps, to any gas fixture which may be in electrical connection with the earth.

The running of concealed wires to the electroliers, or lamps, under any circumstances. They must be entirely open to view.

The placing of any distributor box or regulator, electrolier, bracket or lamp in such a position that it may be connected in any way with any other wires, steam fittings, gas pipes, gas fixtures, etc., which may be electrically connected with the earth.

The placing of distributors, electroliers, etc., in any damp location, or in close proximity to any metals or other conductor of electricity.

The building or placing of anything around the distributor or regulator so as to cut off easy access to it, or obstruct the access of air to it.

All joints, after leaving the distributor or regulator, must be soldered, using acid as flux. Resin will not be approved under any circumstances.

All new devices should be submitted to the inspector of the union, and must be approved by him before the permission can be given for their use.

While these rules are intended to be complete, some cases may arise where, in the judgment of the inspector, some deviation from them may be necessary in order to secure safety.

THE FOLLOWING FORMS SHOULD BE USED IN POLICIES:

Permission is given for the installation and for the use of such wires, lights and apparatus of any electric light or electric power system, located in or on the insured premises, as have been or shall be approved by the Boston Fire Underwriters' union.

ENGLISH REGULATIONS.*

The difficulties that beset the electrical engineer are chiefly internal and invisible, and they can only be effectually guarded against by testing or probing with electric currents. They depend chiefly on leakage, undue resistance in the conductor, and bad joints, which lead to waste of energy and the dangerous production of heat. These defects can only be detected by measuring, by means of special apparatus, the currents that are either ordinarily, or for the purpose of testing, passed through the circuit. Should wires become perceptibly warmed by the ordinary current, it is an indication that they are too small for the work they have to do, and that they should be replaced by larger wires. Bare or exposed conductors should always be within visual inspection, and as far out of reach as possible, since the accidental falling on to, or the thoughtless placing of, other conducting bodies upon such conductors would lead to short circuiting, and the consequent sudden generation of heat, due to an increased current, in conductors not adapted to carry it with safety.

*Rules and regulations for the prevention of fire risks arising from electric lighting, recommended by the council in accordance with the report of the committee appointed of Telegraph Engineers and of Electricians, May 11, 1882.

The necessity cannot be too strongly urged for guarding against the presence of moisture, and the use of earth as part of the circuit tends to magnify every other source of difficulty and danger.

The chief dangers of every new application of electricity arise from ignorance and inexperience on the part of those who supply and fit up the requisite plant.

The greatest element of safety is, therefore, the employment of skilled and experienced electricians to supervise the work.

I.—THE DYNAMO MACHINE.

1. The dynamo machine should be fixed in a dry place.
2. It should not be exposed to dust or flyings.
3. It should be kept perfectly clean and its bearings well oiled.
4. The insulation of its coils and conductors should be practically perfect.
5. All conductors in the dynamo room should be firmly supported, well insulated, conveniently arranged for inspection, and marked or numbered.

II.—THE WIRES.

6. Every switch or commutator for turning the current on or off should be constructed so that when it is moved and left it cannot permit of a permanent arc or of heating.

7. Every part of the circuit should be determined that the gauge of wire to be used is properly proportioned to the currents it will have to carry, and all junctions with a smaller conductor should be fitted with a suitable safety fuse or protector, so that no portion of the conductor should ever be allowed to attain a temperature exceeding 150 degrees Fah.

8. Under ordinary circumstances, complete metallic circuit should be used; the employment of gas or water pipes as conductors, for the purpose of completing the circuit, should not in any case be allowed.

9. Bare wires passing over the tops of houses should never be less than seven feet clear of any part of the roof, and all wires crossing thoroughfares should invariably be high enough to allow fire escapes to pass under them.

10. It is most essential that joints should be electrically and mechanically perfect and united by solder.

11. The position of wires when underground should be clearly indicated, and they should be laid down so as to be easily inspected and repaired.

12. All wires for indoor purposes should be efficiently insulated, either by being covered throughout with some insulating medium, or, if bare, by resting on insulated supports.

13. When these wires pass through roofs, floors, walls or partitions, or where they cross or are liable to cross metallic masses, like iron girders or pipes, they should be thoroughly protected by suitable additional covering; and where they are liable

to abrasion from any cause, or to the depredations of rats or mice, they should be efficiently encased in some hard material.

14. Where indoor wires are put out of sight, as beneath flooring, they should be thoroughly protected from mechanical injury, and their position should be indicated.

N. B.—The value of frequently testing the apparatus and circuits cannot be too strongly urged. The escape of electricity cannot be detected by the sense of smell, as can gas, but it can be detected by apparatus far more certain and delicate. Leakage not only means waste, but in the presence of moisture it means destruction of the conductor and its insulating covering, by electric action.

III.—LAMPS.

15. Arc lamps should always be guarded by proper lanterns, to prevent danger from falling incandescent pieces of carbon, and from ascending sparks. Their globes should be protected with wire netting.

16. The lanterns, and all parts which are to be handled, should be insulated from the circuit.

IV.—DANGER TO PERSON,

17. Where bare wire out of doors rests on insulating supports, it should be coated with insulating material, such as india-rubber tape or tube, for at least two feet on each side of the support.

18. To secure persons from danger inside buildings, it is essential so to arrange and protect the conductors and fittings that no one can be exposed to the shock of alternating currents of a mean electromotive force exceeding 100 volts, or to continuous currents of 200 volts.

19. If the difference of potential within any house exceeds 200 volts, the house should be provided with a switch, so arranged that the supply of electricity can be at once cut off.

ABSTRACT OF THE CHICAGO ELECTRIC LIGHT LAWS.

No plant shall be run without a certificate of inspection from the superintendent of city telegraph. No wire of less conductivity than number 6 B. and S. copper shall be used for arc lights. The conductors shall be fireproof, coated and well insulated, run eight inches apart on insulators along walls and ceilings, well insulated through walls, floors, etc. Lamps must have globes and be protected from accidental contact, and where light, inflammable matters are near, the globes must have wire screen spark protectors. Where dynamos are open to the public they must be protected by rail or screen. Incandescent circuits may be run in moldings, but in all cases soft fusible metal strips of proper size must be placed at each branching of the wire.

The insulation resistance required is one megohm (1,000,000 ohms), and the inspection fee is one dollar per horse power used—one ordinary arc light being allowed per horse power, or ten 16 candle power incandescent lamps.

The plant cannot be legally altered after inspection, except by first notifying the city electrician. While the plant remains in the same condition as at the date of the certificate, the document is valid.

Violation of any one of the above requirements subjects the party so transgressing to a fine of from \$50 to \$100 for each day the infraction is continued.

Commissioner Gibbens read a newspaper statement and offered a resolution as follows:

THE MAYOR AND THE WIRES.

"Mayor Hewitt said yesterday that he was in no way responsible for the failure to get electric wires underground, that he was the author of the original bill under which the Subway Commissioners were appointed, and that he had voted for every practical measure to get the wires underground. He felt that he had done all he could to get the work done."

Resolved, In the opinion of this Board, the above is an unqualified and malicious, false statement, calculated to deceive the public, it being well known to the Board.

First, That the author and promoter of the original subway legislation is not Mr. Hewitt.

Second, That the only enactment on the subject with which Mr. Hewitt has had anything whatever to do, is the laws of 1887, which made him a member of the Board and imposed upon him the duty of carrying out the remedial clause of the law, which he has neglected to do.

Third, That Mr. Hewitt has never, previous to the publishing of the above statement, voted for any considerate measure calculated to convert the wires now overhead to underground wires, nor introduced nor advocated such a measure, nor voted for the construction of any subways; but, on the contrary, has done everything in his power to obstruct the purposes for which the Board is constituted, by declining to vote, upon frivolous grounds which he has since abandoned by voting adversely, by attempting to make members and officers of the Board appear ridiculous, by protesting against tearing up the streets.

Fourth, That Mr. Hewitt has refused to order the removal of poles and wires when repeatedly requested to do so by this Board.

Fifth, That these actions on the part of Mr. Hewitt have seriously impaired the usefulness of the Board, hampered it in its work, and obstructed its proceedings; and,

Sixth, That it is mainly owing to the failure of Mr. Hewitt to obey his oath of office and carry out his part as a member of the Board, and as Mayor of the City, in rendering the law effectual, that the Rules and Regulations of the Board are not observed, and that thereby the lives and property of citizens are threatened.

Unanimously adopted.

He also moved the following resolution:

Resolved, That hereafter the Board of Electrical Control meet in their office, No. 1218 Broadway.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Friday, May 25th, 1888, at 12 o'clock, noon.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of the previous meeting were read.

Commissioner Gibbens moved the following resolutions:

Resolved, That the minutes stand approved as read, and that the Secretary be authorized to correct the typographical errors in the printed minutes.

Unanimously adopted.

Resolved, That the Rules and Regulations for Overhead Wires be printed over again, and something be placed on them to show where they emanate from, also the date of their adoption.

Unanimously adopted.

The following report of Engineer Kearny was read:

New York, May 25th, 1888.

To the Honorable, the Board of Electrical Control:

GENTLEMEN:—I have to recommend that the Consolidated Telegraph and Electrical Subway Company be directed to construct subways, as per request submitted to your Board April 17th, 1888, on the following streets and avenues, namely:

On Frankfort street, from Park Row to the intersection of Dover and Pearl streets,

On Stone street, from Broad to William streets.

On William street, from Exchange Place to and through Old Slip to Front street and Front street to Gouverneur's Lane.

On Hanover Square and Pearl street, from William street to Maiden Lane and Frankfort street.

On Maiden Lane, from Broadway to Front street, and along Front to Pine street.

On Nassau street, from Maiden Lane to Pine street; and

On William street, from Pine street to Maiden Lane; also

On Broadway, from Vesey to 14th streets and Union Square, to connect with existing subway near Lincoln Monument; and

On Lexington avenue, from 58th street north to 65th street; and

On 23d street, from 5th to 11th avenues, and along 11th avenue to 24th street and west to Hudson River.

All of the above-named work to be constructed of iron tubes laid in hydraulic cement, except the Lexington avenue and 23d street sections, which are to be cement pipe laid in concrete, the numbers varying on almost every succeeding block, according to the requirements of the service, as indicated on accompanying map hereto attached.

I have endeavored in naming the number of ducts in each place to allow from 33 1-3 to 50 per cent. increase over the present requirements, which I think is ample.

The accompanying maps will indicate the routes and number of ducts desired to be built.

Very respectfully,

HENRY S. KEARNY, Engineer.

Commissioner Gibbens thereupon moved the following resolution:

Resolved, That the specifications and routes of the work recommended by the Engineer be approved by the Board and that the Consolidated Telegraph and Electrical Subway Company be authorized and directed to proceed to construct the subways in accordance with these plans.

Unanimously adopted.

Commissioner Moss moved the following resolution:

Resolved, That the Engineer of the Commission be directed to ascertain the requirements of the various electric light companies operating in all parts of the city, and recommend to this Board the construction of subways for their accommodation at his earliest convenience.

Unanimously adopted.

The following communication from the Mayor was read; and, upon motion of Commissioner Moss, was ordered to be spread on the minutes:

MAYOR'S OFFICE,

NEW YORK, May 23, 1888.

THEODORE MOSS, ESQ., Secretary of the Board of Electrical Control, 1218 Broadway, City:

SIR:—I am in receipt of your letter of the 22d instant, enclosing a copy of a resolution adopted by the Board of Electrical Control, held on the 17th of April, in which the Mayor is requested to order the removal by the Commissioner of Public Works, through the Bureau of Incumbrances, of wires, poles and other fixtures in certain streets enumerated in the resolution.

I call your attention to the delay which has transpired in communicating this resolution to me for action. It was adopted on the 17th of April, but is not brought officially to my notice until this day, and that only in consequence of an intimation from me that I had never been furnished with a copy of the resolution for failing to consider which I was at a subsequent meeting of the Board of Electrical Control subjected to censure. I also note, by reference to the copies of the minutes of the meeting of the 17th of April,

which you transmit, that you have now communicated to me only in part the resolution which was adopted, leaving me to ascertain the nature of your action from the printed minutes. I am content to derive my knowledge of your action from these minutes, although it is proper for me to say that, between co-ordinate branches of the city government, it is the practice to transmit, in all cases, full copies of any official action which may require to be considered by any other department of the government.

Whether the failure to pursue the usual course in this matter was due to any design on the part of your Board, I do not pretend to know; but, in the interval, the most persistent efforts have been made by members of your Board, and in other quarters, to misrepresent the action and the position of the Mayor upon this question and to lead the public to suppose that he was wilfully refusing to perform a duty which was made obligatory upon him by statute. The only provision in reference to the matter, affecting the Mayor, is contained in Section 3, of Chapter 716, of the Laws of the State of New York for the year 1887, and is in the following words:

"This provision is made a police regulation in and for the City of New York, and in case the several owners or operators of such wires and the owners of such poles, fixtures or devices, shall not cause them to be removed from such street or locality as required by such notice, it shall be the duty of the Commissioner of Public Works of said city to cause the same to be removed forthwith by the Bureau of Incumbrances, upon the written order of the Mayor of said city to that effect." It is to be observed that no duty is imposed upon the Mayor by these words. Power is undoubtedly conferred upon him to give a written order to the Commissioner of Public Works to remove poles and wires and other fixtures; but it is clearly discretionary with the Mayor whether he shall give such an order, or refrain from giving it.

On the receipt of a previous resolution from your Board, requesting such an order to be given, I addressed a letter to the Commissioner of Public Works asking him whether it would be in his power to execute the order if given, to which the Commissioner of Public Works replied that there was no money under his control available for the execution of the order. I transmitted a copy of the correspondence between the Mayor and the Commissioner of Public Works, in due course; but for some reason which I do not understand it was never presented to the Board of Electrical Control, but has since been published in the minutes of the meeting of May the 10th. By reference to the letter of the Commissioner of Public Works you will perceive that the only remedy suggested by him is a transfer of some other appropriation to the fund available for the use of the Bureau of Incumbrances. Such a transfer can only be made by the Board of Estimate and Apportionment, upon the application of the Commissioner of Public Works, and from some other fund for which the money is not needed. I am still without any information from him as to the possibility of diverting any other appropriation to the use of the Bureau of Incumbrances, for the purpose of complying with the order which you request me to give. As soon as I receive from the Commissioner the information necessary, I will convene a meeting of the Board of Estimate and Apportionment, for the purpose of considering the propriety of the transfer.

I am quite as desirous as any member of your Board that the overhead wires controlled by the electric light companies, transmitting currents of high tension, should be put underground at the earliest possible moment. They are unquestionably dangerous, and many accidents have occurred in consequence of their existence in the streets. It is by no means clear, however, that when they are buried in the ground the same accidents will not occur from the wires which are used for local distribution. So far

as I know, no satisfactory plan has yet been submitted to the Board of Electrical Control or adopted by them. I enclose herewith the report of a lecture, given by Professor G. W. Plympton, a reliable authority, and one of the Commissioners of Electrical Subways, of the City of Brooklyn, in which it is stated that after a careful examination he has not yet been able to find that any satisfactory method of local distribution has yet been devised. It is, therefore, an open question whether the Mayor should exercise the discretion which is confided to him by law, by giving the written order which is made a condition precedent to the action of the Commissioner of Public Works. But, even if the Mayor would be justified in overlooking the fact that the details of the local distribution have not yet been determined, he must take into consideration the further fact that any attempt on the part of the Commissioner of Public Works to obey the order would be followed by three important consequences. First, if he should cut the wires, the electric current would be free to do its work of destruction upon the men employed to take down the poles and wires as well as upon the passers by. Secondly, that the streets in which these wires are suspended would be left in total darkness until the Superintendent of Lamps and Gas could arrange to supply the requisite light with gas lamps. These have all been removed from the main streets and have been used from time to time in extending the lighting facilities with gas in other parts of the city. Thirdly, the electric light companies would undoubtedly take legal proceedings to prevent the Commissioner of Public Works from interfering with their contracts with the city and with private consumers until their rights had been judicially determined.

In view of this last consideration, I have already instructed the Corporation Counsel to take such proceedings as the law will permit against the electric light companies, to compel them to comply with the provisions of the statute which requires them to place their wires in subways within ninety days after notice has been given to them by the Board of Electrical Control to that effect. The Corporation Counsel has not yet made an official reply to my communication, but he has verbally told me that he thinks that there is an adequate remedy at law for the failure of the electric light companies to comply with its provisions. If this should turn out to be the fact, the method which I have adopted will be altogether the speediest mode of compelling the electric light companies to comply with the law, and it will be free from the other difficulties which I have specified, namely, danger to life and property, and the inconvenience of depriving the streets of proper light at night. I respectfully submit, therefore, that my action from first to last has been entirely consistent with the opinion which I have always expressed and still entertain, that no time should be lost in relieving the streets from the dangerous encumbrance of high tension electrical currents, and that the means which I have adopted will most speedily affect the object which the Legislature had in view, and in which I heartily concurred, when the revision of the law was made in 1887, under which the Board of Electrical Control was completed. It has been stated in one, if not more, of the public newspapers that I opposed the enactment of that law. This is an error against which I feel bound to protest. It is within your knowledge and that of the officers of the Telephone and Telegraph Subway Company, that I spent much time in considering and in framing the law which was finally passed. I have never stated to any person that I had any part in the adoption of the original measure, and certain abusive resolutions which I find upon your minutes of May the 10th are, therefore, based upon an entire misrepresentation of the facts. In the law, as it now stands, I opposed one feature, however, which was not in the draft originally approved by me. In that draft, the Comptroller and the Commissioner of Public Works, as well as the Mayor, were made members of the Subway Commission. This feature was stricken out of the law, and I stated then, as I am free to reaffirm now, that I regarded the law, with the

omission of these municipal officers, to be injurious to the public interests. I think the events of the last year will fully confirm the opinion which I then expressed and still entertain.

It has also been sought to create the impression that I have been obstructing the operations of the Commission. An intelligent examination of the minutes of the Board of Electrical Control will show that I have opposed only such propositions as were absolutely conceived in ignorance, or, if adopted, would have produced very great, if not irreparable, evils. For example, I opposed and defeated a proposition to appoint uneducated and incompetent inspectors, and if now the Board shall finally see fit to appoint these inspectors, as I trust they will, they will have been subjected to a civil service examination, against which the Commissioners vigorously protested at the time when I took the steps which secured this result. The records will show that I have regularly voted for all propositions to extend the subway lines, which could be executed within the limits of the season when such work could be done. As a matter of fact, the lines authorized in the year 1887 were far in excess of the ability of the Subway Company to construct, and a very large surplusage of authorized lines have come over into the present year. In addition to these lines, I have voted for the entire system of extension recommended by the Subway Company and approved by the Engineer of the Board of Electrical Control. In view of the impatience of the public to be relieved from the dangers of high tension currents, I can very well understand how an impression could be created by malicious persons against the action of the Mayor; but, inasmuch as I have at all times governed my action with a view to the earliest possible removal of the evils complained of, and, independently of the Board, have finally succeeded, as I hope, in devising a remedy by which the result desired will be achieved through a judicial decision which will set the whole matter at rest, I suppose I can, without any loss of self-respect, call your attention to the scurrilous, untruthful and intentionally insulting resolutions which the Board adopted and allowed to be printed in the minutes of May the 10th. These resolutions, I think, are without a parallel in the history of any official body, and so long as they remain upon the record, they make all personal association between the other members of the Commission and myself impossible. Officially, I shall perform every duty required of me by the law. But inasmuch as my declarations and action have been misunderstood in some quarters, I deem it proper to explain to the public that the Commission consists of four members, of whom the Mayor is one by virtue of his office, and not otherwise. In order to pass any resolution, the vote of three members is required. Except in cases where the vote has been unanimous, I have generally been in a minority of one. My presence, therefore, is no real consequence, except there should be a difference of opinion between the other members, which their action in the resolution of censure seems to make improbable. But in any such case I should feel it to be my duty to appear and record my vote, provided the meetings are held at such time and place as will admit of my attendance without neglecting other duties of my office equally important and more pressing.

Respectfully,

ABRAM S. HEWITT, Mayor.

PROFESSOR G. W. PLYMPTON'S REPORT.

Prof. G. W. Plympton, of the Brooklyn Subway Board, addressed the meeting on "Underground Electrical Systems in Europe and America." He said that the problem of placing the wires underground is solved, so far as telegraph and telephone wires are concerned, but as to the burying of the arc light wires he believed it yet awaits

solution. He did not think that any method yet proposed was a sure one. One thing he was certain of, that the arc light wires could not be buried in the same conduits with the telegraph and telephone wires, and the latter worked successfully. The danger of leakage of the strong currents, he said, was one reason, and another was that the variations of the strong currents produce, by induction, disturbing effects on the others, the telephone especially. Insulation does not prevent induction; in fact, the better the insulation the more decided the induction in most cases. The best insulator is dry air, but it has been found in practical tests in Brooklyn that at a distance of a hundred feet induction has produced a disturbance in telephone work sufficient to prevent good service. Experiment is yet necessary to demonstrate whether iron pipe shields for the arc light wires will put a stop to that disturbance, and, if so, what thickness of iron should be used and how it should be disposed. He saw no way of bringing all the wires into one conduit, and was not sure that it was desirable, even if practicable, to do so. "Last summer," he continued, "I went over to Europe to determine from personal observation how far wires had been buried there, and visited all the cities where there is claimed to have been most progress in electrical conduction. They had nothing new to teach us about burying telephone wires. In fact, none are buried, except a few Government wires. In London the telegraph and telephone wires are carried on the housetops, right of way being purchased from householders, and a special act of Parliament would be necessary to enable the burying of wires for public service. The Postal Telegraph wires are carried under the streets, and some Government telephone wires are run with them, but they simply extend between stations, and they have not solved the question of distribution to private parties at all. In Brussels the wires are thickly stretched overhead, and no effort has been made to put them underground. Householders are paid at the rate of about ten cents per annum for each wire fastened to the supports on their roofs. Fine, strong wires are used, and the supports are far apart. Before I left there the local manager showed, with pride, a new line of about a mile in length, the wires of which were hung upon short arms near the tops of light ornamental iron pillars fifty or sixty feet high. At Berlin only the military lines of telegraph are underground and all others upon housetops. At Paris the telegraph and telephone wires are in cables, slung to the roofs of the sewers, and an arc light wire would not be allowed to enter the same sewer. Where there are no sewers the housetops are used, the right of way being bought from the householders."

In Munich, Venice, Milan, Turin, and other places, the speaker found telegraph and telephone wires partly strung on housetops and partly supported by pretty brackets just beneath the eaves, on the walls of the house, and none underground. Burying the telephone wires had been tried in Bordeaux, he had been told, but unsuccessfully. Nowhere in Europe did he find electric light arc wires carried to such long distances for street lighting as in this country. The dynamos are always close to the lamps they supply; and there has been a great decline in the use of the arc lights within three years past. The long line of them on the Avenue de l'Opera in Paris has been removed and grouped gaslights substituted in their stead. New York is far ahead of all the rest of the world in this style of street lighting. The only place he found where all the wires are underground is Newcastle, Eng., and there are no arc light wires there, and the telegraph and telephone services are small.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to answer the communication of the Mayor;

To call his attention to the requests made by the Board to the effect that he order the Commissioner of Public Works to remove poles and wires, and to the fact that these requests cover a period of more than six months;

To suggest that, in the opinion of the Board, the matter is not discretionary with the Mayor;

To enclose a copy of previous statements of the Board in answer to the objections raised by the Mayor to doing what the Board requests;

To state that, in the opinion of the Board, the defense which the Mayor tries to make of his action as a member of this Board is entirely inadequate; and finally,

To enquire of the Mayor whether he desires to avail himself of his privilege as a member of this Board to attend its meetings, and, if so, what time and place will be convenient.

Unanimously adopted.

The following communication from the Consolidated Telegraph and Electrical Subway Co. was read and ordered to be spread on the minutes:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,

18 CORTLANDT STREET, NEW YORK, N. Y., May 25th, 1888.

To the Honorable, the Commissioners of the Board of Electrical Control, 1218 Broadway, New York City, N. Y.:

GENTLEMEN:—In 1887 certain sections of subway work were laid out for the accommodation of telephone requirements in the district on the east side of Broadway, connecting at Spring street with the rest of what is known as the "Spring Street System," and this work was duly authorized by your Board. The Department of Public Works subsequently issued to this Company permits for this work excepting for "Crosby street," which was refused on account of said street being under contract for repaving.

The delay thus occasioned led the Metropolitan Telephone and Telegraph Company to revise their requirements in this district. They now request the following slight changes in the lines authorized, viz.: The extension of the Grand street and East Houston street lines from Crosby street to a junction with the Broadway line.

The above extension is to be substituted for the sections on Crosby street, from Grand to Houston; and in Spring street, from Crosby street to Broadway.

I request that your Board sanction the above changes. I am,

Very respectfully yours,

LEONARD F. BECKWITH, Chief Engineer.

Commissioner Gibbens offered the following resolution:

Resolved, That the recommendations of Engineer Kearny, as follows, be adopted by the Board:

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NEW YORK, May 25th, 1888.

To the Hon. Board of Electrical Control:

GENTLEMEN:—Having examined the request of the Consolidated Telegraph and Electrical Subway Company, made to you to-day, for authority for a change in the routes in Grand and Houston streets, as ordered by you in 1887, and approving of the same, I have to recommend that you authorize the request as mentioned in the above mentioned communication. Anticipating a favorable action on your part, I have included in my report to you to-day additional accommodation on Broadway in the vicinity of Grand and Houston streets, in Subway to be constructed.

Very truly,

HENRY S. KEARNY, Engineer.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Friday, June 8th, 1888, at 3 o'clock P. M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of the previous meeting were read.

Commissioner Gibbens offered the following resolution:

Resolved, That the minutes be approved as read.

Unanimously adopted.

The following communications from the State Civil Service Board were read:

Form II.

CIVIL SERVICE—STATE OF NEW YORK.

OFFICE OF THE CIVIL SERVICE COMMISSION,

ALBANY, June 4th, 1888.

SIR:—In response to your notice of a vacancy in your Board in Class , Sub-division , Grade , dated June , 1888, I have the honor to certify to you, in accordance with the Civil Service Rules, the following three names from the register of persons eligible to such grade, having the highest general standing as Inspectors of Electrical Conductors:

[JUNE 8, 1888.]

Names.	P. O. Address.	Standing.
R. J. Reilly,	Station L, New York,	95.
F. J. Fitzpatrick,	1198 Ogden Ave., Highbridge, N. Y.,	92.
Malcolm S. Keys,	Yonkers, N. Y.	90.

I have the honor to be

Your obedient servant,

CLARENCE B. ANGLE, Secretary.

To the Board of Electrical Control,
1218 Broadway,
New York City.

Form 11.

CIVIL SERVICE—STATE OF NEW YORK.

OFFICE OF THE CIVIL SERVICE COMMISSION,

ALBANY, June 4th, 1888.

SIR:—In response to your notice of a vacancy in your Board in Class ,
Sub-division , Grade , dated June , 1888, I have the honor to cer-
tify to you, in accordance with the Civil Service Rules, the following three names from
the register of persons eligible to such grade, having the highest general standing as
Inspectors Underground Construction:

Names.	P. O. Address.	Standing.
Soldier. Wm. Mitchell,	24 State Street, New York.	71.
Henry E. Barton	49 Fifth Avenue, New York.	93.
Leonard Wager,	39 Clinton Place, New York.	86.

I have the honor to be

Your obedient servant,

CLARENCE B. ANGLE, Secretary.

To the Board of Electrical Control,
1218 Broadway,
New York City.

Form 11.

CIVIL SERVICE—STATE OF NEW YORK.

OFFICE OF THE CIVIL SERVICE COMMISSION,

ALBANY, June 4th, 1888.

SIR:—In response to your notice of a vacancy in your Department in Class ,
Sub-division , Grade , dated June , 1888, I have the honor to cer-
tify to you, in accordance with the Civil Service Rules, the following three names from
the register of persons eligible to such grade, having the highest general standing as
Electrical Experts:

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Names.	P. O. Address.	Standing.
Schuyler S. Wheeler,	322 7th Ave., New York.	88.50
Geo. P. Wardell,	2044 Madison Ave., New York.	85.30
Edw. M. Waring,	366 DeKalb Ave., Brooklyn.	76.00

I have the honor to be

Your obedient servant,

CLARENCE B. ANGLE, Secretary.

To the Board of Electrical Control,
1218 Broadway,
New York City.

Commissioner Gibbens moved the following resolutions:

Resolved, That the candidates for positions under this Board, as certified by the Civil Service Commission, be notified to appear before the Board on Monday at 11 o'clock A. M., in order that we may be further informed in regard to them from personal examination.

Unanimously adopted.

Resolved, That the Secretary request the State Civil Service Board to send us the names of others certified as competent for the positions named.

Unanimously adopted.

The following communications and papers were read and ordered (with the exception of the names appended to some of them) to be spread on the minutes:

NEW YORK, May 25th, 1888.

To the Board of Electrical Control, 1218 Broadway, New York:

GENTLEMEN:—I desire, in view of the excitement which the operation of electric light aerial wires appears to have created in the public mind, to advise you that the Mount Morris Electric Light Company have, in defiance of the rules of your Board of Fire Underwriters, run their wires under and upon awnings, and made attachments to buildings, as will be found specially noted below.

Wires are run under and upon the awnings on Greenwich street, at the following numbers:

East Side—173, 175, 177, 181, 185, 203, 205, 207, 209, 211, 213, 223, 237, 239, 241, 243, 245, 253, 255, 261, 263, 269.

West Side—180, 190, 208, 210, 212, 222, 228, 230, 232, 234, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 270, 276, 288, 294, 296, 298, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 338, 340, 342, 344, 346, 348.

Attachments on buildings at 190, 192, 204, 215, 221, 222, 224, 238, 240, 262, 272, 276, 282, 292, 332, 334, 353.

[JUNE 8, 1888.]

In case of trouble with the Fire Department in regard to these wires, this Company will indirectly feel the effect of any trouble which may ensue from the manner in which these wires have been run, as this Company has strictly conformed to all rules with regard to running circuits, and confined its wires to those streets where its poles are available for their support, and I do not intend that this Company shall indirectly receive condemnation by the illegitimate use of circuit wires by other companies who set all rules at defiance, and I give you this notice in order that whatever action you may deem it wise to take, may be taken promptly for our mutual protection.

Very respectfully yours,

EUGENE T. LYNCH, President.

DEPARTMENT OF PUBLIC WORKS,

COMMISSIONER'S OFFICE, No. 31 CHAMBERS STREET,

NEW YORK, May 29th, 1888.

To the Board of Electrical Control:

GENTLEMEN :—Complaint has recently been received by this Department against the placing of electric light wires on wooden awnings in Greenwich and Washington streets, between Chambers and Dey streets; and in Chambers, Warren, Murray, Barclay, Vesey, Fulton and Dey streets, and in Park Place. Upon this the Superintendent of Incumbrances made report that the Mount Morris Electric Light Company has attached and strung electric wires on 34 different awnings in Greenwich street, 19 in Washington street, 9 in Warren street, 2 in Murray street, 9 in Park Place, 16 in Barclay street and 4 in Vesey street. I desire to be informed, at your early convenience, whether your Board has given special permission to the Mount Morris Electric Lighting Company, or to any other company, to attach electric wires to wooden awnings, or other awnings, and whether that method of placing and stringing wires is in conformity with your rules and regulations.

Yours respectfully,

D. LOWBER SMITH,

Deputy and Acting Commissioner of Public Works.

OFFICE OF

THE MOUNT MORRIS ELECTRIC LIGHT COMPANY,

56 BROAD ST., N. Y.

THEO. MOSS, Esq., Secretary of the Board of Electrical Control, 30th St. & Broadway, N. Y.:

DEAR SIR:—You have called the attention of the officers of this Company to a letter from the President of the U. S. Illuminating Co., condemning our work in running wires upon awnings.

Also to a letter from the Department of Public Works something to the same purpose, and which is in connection with a complaint to that Department no doubt from the U. S. Co. also.

Notwithstanding the wretched condition of the United States' wires throughout the city, with which condition your Board is no doubt well acquainted, and the constant menace that such conditions engendered not only to lives and property, but also through these dangers the business of all the Electric Light Companies, we have refrained from making complaint against persons in the same profession who were rivals in business, for reasons which any honorable gentleman will readily appreciate.

But it has lately come to our knowledge, that exasperated by our steady success, conscious that our lights were superior, and that it was only a question of time when their own would be entirely supplanted, they have struck such foul blows that not to strike back now would be understood a confession that we were wrong.

To answer your inquiry we state First, That our work is safe and that an inspection will show that it is much superior to that of the United States Company.

In corroboration of these facts we enclose a petition from business men in the vicinity asking that, on account of superior service, our facilities be extended and also a copy of permits from lessees and property owners giving use of their awnings.

Second, That after careful study we are unable to see how any one can reach a lamp under an awning without fastening to the awning, and in support of that fact we give below a list of about fifty awnings in the same territory to which the U. S. Company's wires are attached and we further explain that the only reason they do not fasten to more is that their lamps have in just so many places been supplanted by Mount Morris Lights.

Third, That the situation, instead of being made worse by the advent of New Electric Light Companies, is constantly improving, and for this reason, viz.: That the poor insulation and poor workmanship of such companies as the United States, made still worse by reason of extreme old age, is now being replaced by brand new wires of the new Companies' system, built with the best of insulation and good workmanship.

And it is evident that if no more summary steps are taken the older companies, from sharp competition, will be forced either to improve their plant or relinquish the field, either of these steps being decidedly to the advantage of the public.

The United States Company are on awnings in the following places:

Washington St., 214, 216, 224, 230, N. W. cor. Murray, 267, 269, 271, 237, 287, 296, 298, 321, 348; Park Pl., 97, North side between Washington & West; Chambers St., 184, 186; Reade St., 177, 179, 181, 185, 187, 189, and north side at Nos. 4 and 5 Erie Building; Duane St., 192, 196, 197, 198, 204, 206; Greenwich St., 241, 243, 245, 334; Jay St., 21, 23, 25; Barclay St., 83, 94; Vesey St., 63; New Church St., 2, 31; Fulton Market, South St., two places.

Your attention is called especially to the following defects in the awning work enumerated above.

At 214 and 216 Washington street, porcelain hooks are placed in wrong position, common white wire is used, and there are already signs of heat.

At 97 Park Place, the United States lamp and wires have at some time in the past set the woodwork on fire, as the charred surface still shows. Fortunately our own wires and lamp have replaced the United States, and there is now no danger.

At 296 and 298 Washington St., a United States lamp has been recently placed and is most dangerously situated. Common white wire has been used and the wires have been carried directly through the awning roof instead of over the edge, as is customary. To prevent the roof leaking canvas bag sand burlaps are placed around the wires and have been there, we are told, during the recent rains. If spontaneous combustion does not occur very soon the covering of the arc light wires is sure to rot and electric light can be duly credited with another conflagration. Lying all about this roof in close proximity to the canvas bags are tangled masses of bare iron wire.

At 192 Duane St., the high tension wires of the United States Company (common white wire) are encased in wooden moulding—a most dangerous practice, and contrary to Underwriters' rules.

At 83 Barclay St., the charred woodwork still remaining shows that a defective rubber hook has at some time caused a slight fire. The rubber hook has been replaced at this point by a porcelain insulator, but we observed others at other places. These hooks are a dangerous fastening, and should be condemned at once.

On Broadway we examined the United States Company's wires from Beaver to Fulton streets and found them in generally bad condition.

They run mostly on telephone poles on the East, and Western Union poles on the West side of Broadway.

Opposite No. 32 Broadway a large loop of bare iron wire in contact with a poorly taped joint of the United States Electric Light wire was hanging within eight feet of the street surface.

Opposite 39 Broadway, a broken wire hangs down from Western Union cross-arm and dangles near United States wires.

Opposite No. 54 Broadway, four small porcelain insulators are put on top of cross-arm instead of underneath, and to make matters worse the wires are bound here with thick masses of tape which gradually rot, soak water, and make ground contacts.

A broken wire crosses Broadway from Nos. 52 to 55, and in front of No. 55 drops down through a mass of Western Union wires, and is in actual contact with the covering of a United States illuminating wire.

Opposite the public entrance to Consolidated Exchange (No. 62 Broadway), is a dangerous piece of work on United States Company's wires.

On the corner of Rector and Broadway there is a most thrilling combination of Gold and Stock, Western Union wires, guy wires, and United States Electric Light wires.

On N. W. corner of Rector St., three United States wires lie against pole without insulators.

On lamp post, opposite Pine St., a United States daytime wire is lying on iron frame. We think current could be felt on wet day by touching the pole anywhere on its surface.

In front of 119 Broadway, the United States wires are fastened to Western Union pole with small porcelain insulators, and one of the wires tightly tied to pole step by a piece of twine.

There is a very frail fastening on Benedict Bros' sign, 171 Broadway, which, in falling, will carry a whole mass of line wire into Cortlandt street.

At 183 Broadway and for some distance north, the Electric Light wires are only ten feet above sidewalk and in shocking condition.

It is impossible to give an adequate description of the pole at 164 Fulton St., and the condition of the wires in the alley near by. Please examine it.

I noticed United States wires on fire-alarm poles at Leonard street and Broadway, Thomas street and Broadway, and Chambers street and Broadway.

It is no doubt well known to your Board that mixed in with all the United States System are wires that supply current to arc lights during the day time.

The Mount Morris Company's Directors have steadily voted against inaugurating any Day Circuits of high tension. Starting time is now after six o'clock P. M., and every lineman is called in at five P. M. Circuits are tested and examined and none started unless in perfect condition. All night long the circuits are patrolled and watched.

The territory covered by our Company is from Battery Place to Franklin and from Greenwich to North River, and easily patrolled; there are one hundred arc lights supplied by six wires. Every wire is new and perfect. Every insulator carefully placed. Under these circumstances danger is reduced to a minimum, and for a Company like the United States to raise that cry is the height of absurdity.

We say to your Board, as we have said to the Inspector of Fire Underwriters, that we invite suggestions which may secure the public safety.

That if it can be shown that our Company has neglected to take any necessary precaution we will cause the wires to be re-run as rapidly as possible consistent with our duties to the users of lights and in any case limit its construction to a few weeks.

If the United States Company will adopt the same course, i. e., re-run their circuits, it will add greatly to the safety of the public. In all the newspaper discussion on the subject we have seen little mention of this point, viz.: That an electric light circuit perfectly insulated is harmless. It is only when the current makes a path to the earth in one or more parts of a circuit that it becomes deadly. Moreover it is required that the path to the earth shall be a fairly good conductor. But it is also true that the aggregation of many slight escapes on a circuit is equivalent to a serious one, and that is why the United States wires (having many little, to say nothing of more serious defects) are so dangerous.

To conclude, our Company commenced business with much encouragement from his Honor, the present Mayor, who very materially aided the new Companies in obtaining their franchises.

The new Companies have caused his anticipations to be realized in that the expense of City lighting by Electricity has been reduced about one-half and the cost to business houses similarly modified. All this with an absolute increase both in efficiency and safety.

Very respectfully,

THE MOUNT MORRIS ELECTRIC LIGHT COMPANY,

By C. H. SEWALL, Secretary.

[JUNE 8, 1888.]

NEW YORK, June 1st, 1888.

To the Honorable, the Board of Electrical Control, 30th Street and Broadway, New York:

GENTLEMEN:—The undersigned, many of whom are subscribers to the Mount Morris Electric Light system, herewith desire to state to your honorable body that since the establishment of the Mount Morris Plant (on Washington street, near Barclay) users of electric light in that vicinity have been greatly benefited, the rates much reduced, and the service greatly improved. The improvement in service has also extended to the Company formerly having a monopoly of this business, spurred on by reason of sharp competition.

Wherefore, we pray that your honorable body will grant all proper facilities, temporary and permanent, to the Mount Morris Electric Light Company.

Permission is herewith granted to the Mount Morris Electric Light Company to attach to awnings, &c., conducting wires and supports for the same in the places as designated against our respective names. * * *

The others in all cases have given verbal permission, which we can substantiate by affidavits of our employees.

HON D. LOWBER SMITH, Deputy Commissioner of Public Works:

MY DEAR SIR:—Your letter calling the attention of the Board of Electrical Control to the wires of the Mount Morris Electric Light Company in Greenwich street has been received, and the matter investigated.

The Board is unable to discover that the Mount Morris Company has violated any of the rules and regulations of the Board or of the Board of Fire Underwriters of the City of New York; and the Engineer of the Board reports that, in his opinion, the wires referred to in your communication are not dangerous.

While so many flagrant violations of the rules and regulations of this Board and of the Board of Fire Underwriters exist in other parts of the City—especially on streets and avenues where subways have been constructed under the direction of this Board, and where the Mayor has been requested to remove the electrical conductors through your Department—it is not apparent to the Board that any special and impartial effort should be made respecting the conductors of the Mount Morris Company.

Thanking you sincerely for calling the attention of the Board to the matter, I have the honor to be, Very respectfully, your obedient servant,

THEODORE MOSS, Secretary.

NEW YORK, June 8th, 1888.

THEODORE MOSS, ESQ., Secretary Board of Electrical Control, 1218 Broadway, New York:

DEAR SIR:—Your letter of June 4th, stating that your Board was unable to ascertain that the Mount Morris Company has violated any of the rules and regulations of the Board, has been received, and in reply I beg leave respectfully to suggest that if you, or anybody deputized by you, will apply to this office, I will have a proper person detailed, who will show him the locations where the Mount Morris Company has

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violated the Rules and Regulations of your Board, and shall be happy in this or any other matter in which you are unable to obtain proper information for yourself to yield you every opportunity which I have for obtaining the desired information.

You state further that the conductors of our Company are strung in the same locality in the same style as those of the Mount Morris Company, and in regard to this I would state that we run entirely upon our own poles, which have been erected in accordance with law, which is not the case with the conductors which are run by the Mount Morris Company, and in conclusion, I would say emphatically that your statement that this Company has notoriously violated the Rules and Regulations of your Board is without foundation in fact, as I know of no instance where anything has been done by my orders or to my knowledge, in contravention of the orders issued by your Board, and if you have any instances where it has been done, I think, in justice, you are obligated to furnish me the detailed information to substantiate the charge you make.

Very respectfully yours,

EUGENE T. LYNCH, President.

NEW YORK, June 8th, 1888.

DANIEL L. GIBBENS, ESQ., Commissioner, Board of Electrical Control, 1218 Broadway,
New York:

DEAR SIR:—I am in receipt of your communication of June 4th, wherein you state that you discovered two of our linemen attempting to string a wire across Broadway and Ninth street, without a permit, and in reply I would state that these wires were run for the purpose of lighting a lamp from a circuit at that point, and that we have an absolute permission from the proper authorities to run wire for a similar purpose, namely, making connections to a lamp. It has never been required by your Board that applications should be made for making connections from our circuit in the street to a lamp required by a customer.

I would state further, that we have no recollection of our attention being "repeatedly called" by you to any violation of the Rules and Regulations of the Board of Electrical Control, and if such is the fact, I should be glad to have you designate under what conditions and at what time said notice was sent to us, as we have uniformly confined ourselves strictly to the permits issued by your Board, and have never knowingly done any act in violation of any rules established by your Board.

Very respectfully yours,

EUGENE T. LYNCH, President.

Commissioner Gibbens moved the following resolution:

Resolved, That the Secretary be directed to send to the President of every electric light company in the City of New York the following letter:

[JUNE 8, 1888.]

OFFICE OF THE BOARD OF ELECTRICAL CONTROL,
1218 BROADWAY.

THE MAYOR OF THE CITY OF NEW YORK, (ex-officio),	}	Commissioners.
JACOB HESS, President,		
THEO. MOSS, Secretary,		
DANIEL L. GIBBENS.		

NEW YORK, June 7th, 1888.

SIR:—Your Company is hereby notified that, in the opinion of this Board, electric light conductors are being operated in many parts of the city in a dangerous manner and in violation of the Rules and Regulations of the Board.

You are directed to conform to the Rules and Regulations of the Board in streets where no subways have been provided immediately, and in streets where you have for ninety days been notified to remove your conductors and occupy the subways, you are directed to cease the operation of conductors which do not conform to said Rules and Regulations and said notice.

The Board expects to be in a position to institute rigid inspection of your service within a short time, and further neglect of the Rules and Regulations will be brought to the attention of the proper authorities.

For the Board,

Secretary.

Unanimously adopted.

The following communication was read:

STATE OF NEW YORK,
ATTORNEY GENERAL'S OFFICE,
ALBANY, June 6th, 1888.

DANIEL S. GIBBENS, Esq., Commissioner of Subways, New York City:

DEAR SIR:—Enclosed please find copy of a letter sent us this day by Dos Passos Brothers, Counsel for the New York Underground Telegraph Company.

If a discontinuance meets with your approval, please inform us immediately, and we will sign the necessary stipulations.

Very truly yours,

CHAS. F. TABOR, Attorney-General.

THE PEOPLE, &C.,
vs.
THE N. Y. UND. TEL. CO.

NEW YORK, June 5th, 1888.

HON. CHARLES F. TABOR, Attorney-General:

DEAR SIR:—We understand that all matters at issue between the parties who instigated this suit and the defendant have been satisfactorily adjusted, and that arrangements have been made by them to have this action discontinued, and we therefore enclose herein a formal consent to discontinue, which we should like you to sign and

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return to us, as we are desirous of getting this litigation off our books, and as there is no object now in continuing the suit.

Very truly yours,

(Sd.)

DOS PASSOS BROS.

Commissioner Gibbens asked and was granted permission to send the following answer to the communication of Attorney-General Tabor:

NEW YORK, June 8th, 1888.

HON. CHARLES F. TABOR, Attorney-General, Albany, New York:

DEAR SIR:—Your letter has been received, and in behalf of the Board I beg to thank you for your efforts in its behalf and to assure you that so far as the Board is a party to the suit—The People against The New York Underground Telegraph Company—we have no reason to object to its discontinuance.

Very truly yours,

DANIEL L. GIBBENS, Commissioner.

The following communications from the Mayor were read and ordered to be spread on the minutes:

MAYOR'S OFFICE,

NEW YORK, May 21, 1888.

THEODORE MOSS, ESQ., Secretary of the Board of Electrical Control:

SIR:—I acknowledge the receipt of your letter of the 19th inst., enclosing a copy of the minutes of the Meeting of the Board of Electrical Control, held on the 10th instant. You refer me to certain rules and regulations which were adopted at that meeting, and are by statute made police regulations in and for the City of New York. You are aware that the Mayor has no control of the police, and the statute does not enjoin upon the Mayor any duty in reference to these rules and regulations. The proper course will be for your Board to communicate these rules and regulations to the Commissioners of Police, who will doubtless perform the duties required of them by the statute. In the event, however, of their failure to do so, on proper representation to the Mayor he will perform the duty which is imposed upon him by statute, to wit, to see that all the heads of departments perform their duties in accordance with law.

I take this occasion to call your attention to the fact, that I have not yet received any official copy of a letter which by the minutes of the meeting held on the 17th day of April last appears to have been directed to be sent to the Mayor. Inasmuch as the proceedings of your Board on the 10th of May last appear to a considerable extent to have been based upon this letter which I have not received, and to which consequently I have never made any reply, I would suggest the propriety of supplying the omission at the earliest possible date.

Yours respectfully,

ABRAM S. HEWITT, Mayor.

JUNE 8, 1888.

MAYOR'S OFFICE,

NEW YORK, June 4, 1888.

THEODORE MOSS, Esq., Secretary, Board of Electrical Control, 1218 Broadway, City:

SIR:—I acknowledge the receipt of your letter of the 26th ultimo, in which you prefer again the request that the Mayor shall order the Commissioner of Public Works to remove from the streets, avenues and highways of the city the electrical conductors and fixtures already indicated in previous communications. I have to call your attention to my previous letters to your Board, stating why I do not deem it for the public interest to give the order requested. On the receipt of the last request from your Board, I communicated again with the Commissioner of Public Works, and I now enclose a copy of his letter, dated May the 22d, 1888, as follows:

HON. ABRAM S. HEWITT, Mayor:

SIR:—"Acknowledging the receipt of your letter of May 19th, I have the honor to transmit herewith the reply of Deputy Commissioner Smith. I would say further, that I made no estimate for and did not contemplate the removal of the poles and wires in anticipation of the electric companies not performing the duties which belonged to them. The amount appropriated for the removal of obstructions in the streets was greater than that in the preceding year, on account of the well grounded complaint that the appropriation for that year was entirely insufficient for the proper performance of the duties of the Bureau, and the increase of the appropriation had no relation whatever to the poles and wires.

"As I have already stated orally and in communications, there is one way of obtaining an increase of funds for such purposes, and that is, an application to the Board of Estimate and Apportionment for a transfer from some unexpended balance of other appropriations, after a reference of the case to the Corporation Counsel and his favorable opinion thereon.

"Very respectfully,

"JOHN NEWTON, Commissioner of Public Works."

Inasmuch as the Commissioner of Public Works does not explain the law and the practice in reference to the transfer of appropriations by the Board of Estimate and Apportionment, and as one of your number, Mr. Gibbens, in his testimony before the Coroner's Jury showed that he was entirely ignorant of the manner in which such transfers are made, it is proper for me to explain that a transfer of appropriation from one head to another can only be made upon application of the department in which such transfer is desired, and it is not competent to make any transfer from any appropriation for any other department of the City government except by the consent of the head of such department. The Commissioner of Public Works has not yet indicated any source from which a transfer can be made, and the Board of Estimate and Apportionment have no original jurisdiction in the matter. When such an application is submitted to the Board of Estimate and Apportionment, it will be doubtless promptly considered and acted upon. In the absence, however, of funds available for the removal of the posts and wires, it would be obviously improper for the Mayor to give an order to the Commissioner of Public Works which could not be executed. Mr. Gibbens, in his testimony recently given before the Coroner, staked his professional reputation upon the proposition that the law is mandatory upon the Mayor

to give the order for the removal of the poles and wires. This is a question of law, in which unfortunately three successive counsels to the corporation, two of whom have since been elevated to the bench, do not agree with the learned gentleman who expresses this opinion. But if the law makes it the duty of the Mayor to give the order, it can be enforced by a mandamus, the proceedings for which your Board is respectfully invited to institute without delay, as the Mayor is desirous to do his duty at the earliest possible moment, provided the Court shall hold that any obligation rests upon him to give the order requested. As he is advised, it is his plain duty not to give the order under existing circumstances.

I call attention to the following paragraph in your letter:

"Regarding your intimation that sufficient notice has not been given you of the requests of the Board relating to this subject, I am directed to say that they covered a period of more than five months, the first one having been made to you before the end of last year; and also set forth in the report of the Board unanimously adopted on the 6th of January, 1888." I have made no such intimation. On the contrary, I replied to your first communication in the month of January last, setting forth the reasons why I could not give the order, in substantially the same terms as I now repeat them. What I have charged, and not "intimated," is that you suppressed my reply, and that it was not printed in the minutes of your Board until I called attention to the suppression on the 17th of April last, in consequence of which you have caused to be inserted in the printed report of your minutes a slip containing my letter and the letter of the Commissioner of Public Works. You know, and I do not, why you suppressed these documents.

Lastly, you inquire of me whether I desire to avail myself of my privilege as a member of the Board to attend its meetings, and you ask me to make a reply which will be "intelligible and unequivocal." I regret that you are not able to understand the statement with which my last letter closed. It is not my fault that you do not understand it, as it appears to be understood by everyone else. But I will repeat that I do not propose to come into personal contact with the members of your Board so long as you allow a deliberate insult to the Mayor to remain upon your minutes, except upon occasions when it shall appear that my vote will have any influence on the result of your deliberations, or will serve to protect the public interest. Any time of meeting, therefore, will suit me, and as to the place, you were informed at the time of the organization of the Commission that the Mayor could not attend meetings held elsewhere than in his office or in the immediate vicinity thereof.

I think the public, for whose interests I am bound to care, will acquiesce in the propriety of this decision, when they are reminded that the money which your Board is expending does not come from the city treasury, but under the law is provided by the corporation who is doing the work by virtue of a contract made with your Board. That company may be relied upon to look after the expenditure of its funds, so far as it is possible for them to do so without violating the engagements which were made when your Board was constituted by the legislation which, against the protests of the city government, omitted from the Commission the names of the Comptroller and the Commissioner of Public Works, but secured to the members of your Board, who had no previous training or experience on the subject, a compensation of \$5,000 each per annum for such services as they might be able to render.

I have the honor to be,

ABRAM S. HEWITT, Mayor.

Commissioner Gibbens offered the following resolution:

Resolved, That in answer to the letter just read, the Secretary be directed to send to the Mayor the following reply:

JUNE 6th, 1888.

To the Mayor of the City of New York:

SIR:—Your communication of the 4th instant has been received and contents noted.

The position which you finally assume in reference to the requests of this Board that you remove, through the Bureau of Incumbrances, the poles and wires of electric companies along certain streets and avenues where subways have been prepared, appears to the Board to be in strict accordance with your other actions as a member of the Board, and in connection with the work of the Board as Mayor. You state that you will not order the removal of the poles and wires by the Commissioner of Public Works until money has been provided for the work by a transfer of an appropriation from some other bureau of the Department of Public Works, and that such transfer can only be made upon the request of the Head of the Department made to the Board of Estimate and Apportionment; in other words, you decline to give the Commissioner of Public Works the authority to ask for an appropriation, the non-existence of which is your excuse for not complying with the law.

You have frequently—in fact, upon all possible occasions—displayed your contempt for the opinion of your fellow-citizens and your indifference to their views of your actions; but it passes the comprehension of this Board that you should affect so absolute a disbelief in the intelligence of the public as to treat them to such an absurd and illogical proposition. You will not ask the Commissioner of Public Works to remove the poles and wires until money has been transferred for the purpose, and you know that the money cannot be so transferred until the Commissioner shall request it, and therefore you will not place him in a position where he can consistently make such a request. It reminds the members of the Board of the lady who refused to allow her sons to go into the water until they knew how to swim.

Further on in your letter you state that one of the members of the Board staked his reputation as a lawyer upon the proposition that the law is mandatory upon the Mayor to order the Commissioner of Public Works to make these removals. This is a misstatement. Mr. Gibbens testified that, in the opinion of the Board, the law contemplates no delay on the part of the Mayor in issuing the order; and the language of the Act—"It shall be the duty of the Commissioner of Public Works of said city to cause the same to be removed forthwith by the Bureau of Incumbrances upon the written order of the Mayor"—fully bears out his statement. It may be as you say, that three successive Corporation Counsels have differed with our colleague upon this point, but, at all events, they have never given utterance to such an opinion in a manner public enough to have come to the knowledge of this Board. The proposition on which Mr. Gibbens did stake his professional reputation, as will be shown by the minutes of the stenographer, was to the effect that should the Mayor order the Commissioner of Public Works to remove, and should the Commissioner of Public Works proceed to remove the poles and wires, no court would grant a permanent injunction against such action, in view of the law and of the decisions upon the police powers of states.

It may seem to you very ridiculous to suggest that the Board should mandamus you to perform your duty; but you will bear in mind that recently a Corporation Counsel won a suit undertaken against his own advice, and that infallibility is a rare quality even in city officials.

In reference to your refusal to meet with the Board—howbeit it is guarded with an intimation that you might do so in case there were differences in the Board, and is not peremptory and unmistakable as were your utterances upon the subject at the last meeting which you attended—the Board desires to call your attention to its conclusions upon the subject, inasmuch as you have deliberately forced us to consider the matter and your conduct.

First. The Board does not understand that any public officer is excused from the performance of his duties and obedience to his oath of office because those duties were personally repugnant to him.

Second. The Board does not understand that any public officer is excused from his duties owing to the fact that some one else is lacking in the instincts of a gentleman or personally offensive to the public officer in question.

Third. The Board does not understand that any public official is relieved from the duties of his office by reason of the fact that his actions are made the subject of public criticism.

Fourth. The Board is conscious of having treated the Mayor of the City of New York with the most distinguished courtesy, and neither the Board, nor any member thereof has ever impugned or misrepresented the motives of the Mayor; on the contrary, the Board offered the Mayor the highest honor in its gift; met day after day in his office to suit his convenience; bore with his sarcastic and critical allusions to the personnel and official actions of the Board; proffered him the selection of an expert, who should keep him informed as to the carrying on of the work; patiently endured that the Mayor should assume to put off all the responsibility upon the other members and merely act as a critic, notwithstanding the fact that his responsibilities as a member were in every way equal to those of any other member, and generally paid to him the deference due to his exalted public position and his personal reputation, age, character and ability until he deliberately withdrew.

Fifth. The intimation which you make that the Board is always harmonious, and that you would attend in case of a difference; is liable to the criticism that the members of the Board have frequently differed in the past, and you can scarcely tell when they will do so in the future unless you are present.

Sixth. You say that the Board is expending the money of a Construction Company, and that, therefore, the public will excuse your non-performance of your duty as a member. The Board concludes from recent expressions of public opinion that it is a matter of grave concern to the public that subways shall be constructed properly and the wires placed within them, and that the question of expense has nothing to do with the case; furthermore, the public is interested in the amounts expended in construction, since the city has the right to buy the subways should it seem desirable. The Railroad Commissioners, who are paid by assessments upon the railroad companies, will scarcely be excused from performing their duty for that reason. The Insurance Department could hardly consider that its statutory duties are of no public concern, merely because the State does not directly pay for its maintenance.

[JUNE 8, 1882.]

The Excise Board, which is more nearly in the position of the Board of Electrical Control in its relation to municipal matters than any other department of the City of New York, is not less bound to perform its duties under the law by reason of the fact that it collects the salaries of its Commissioners from the sale of licenses; and it may be said, in this connection, that, without the hearty co-operation of the local authorities the Excise Board would find itself in much the same position as to enforcing the law as that in which the Board of Electrical Control has been placed by your apparent indifference to the success of its endeavors.

In conclusion the Board desires to inform you, as Mayor of the City of New York, that it will continue, from time to time, to request you to order the Commissioner of Public Works to remove the poles and wires of contumacious corporations which refuse to obey the notice of the Board; it will continue to notify you, as a member of the Board, of the time and place of meetings; it will continue to carry out, so far as is in its power, the work for which it was organized, whether with or without your co-operation; but so long as you decline to comply with the requests of the Board and to perform your duties as a member thereof, upon such illogical, absurd, unworthy and ridiculous grounds as those indicated in your letter above referred to the Board must decline further discussion, which tends to dignify your propositions by the assumption that they contain anything worthy of argument.

The fact that subways have been prepared in accordance with law and that they are unoccupied owing to your failure to act up to your obligations as Mayor is a sufficient answer to anything you may have to say upon the whole subject.

For the Board,

THEODORE MOSS, Secretary.

Unanimously adopted.

The following communication was read and ordered to be spread on the minutes:

POLICE DEPARTMENT, OF THE CITY OF NEW YORK,

300 MULBERRY STREET,

NEW YORK, June 6, 1882.

The Honorable The Board of Electrical Control:

GENTLEMEN:—In answer to your communication of the 4th inst., calling attention to alleged violations of the rules and regulations of your Board, by connections, alterations and repairs being made along Broadway and Sixth Avenue by electric lighting companies, the Board of Police have directed me to state that the matter has been referred to the Superintendent, to strictly enforce the law in such cases provided.

Very respectfully,

WM. H. KIPP, Chief Clerk.

Commissioner Gibbens stated that Inspector Williams had called on the Board in reference to the matter of the last communication, and had expressed a desire to be further informed in the matter, and to do what he could for the Board, and the Commissioner offered the following resolution:

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Resolved, That the following answer be sent to Superintendent Murray:

JUNE 8th, 1888.

SUPERINTENDENT MURRAY, Police Headquarters, 300 Mulberry St., City:

DEAR SIR:—In answer to your communication and the personal request of Inspector Williams, the Board of Electrical Control takes pleasure in transmitting herewith a copy of the Rules and Regulations of the Board, and in informing you as to the mode in which your officers can best carry out the provisions of law in reference to electrical conductors and further the work of this Board, to wit:

First. No persons, except employees of the Fire and Police Departments of the City of New York, are authorized to erect any pole or string any electrical conductors above ground in any street, avenue or highway of the City of New York without a written permit of the Board of Electrical Control, signed by Theodore Moss, Secretary.

Second. No persons whatsoever, except employees of the Fire and Police Departments of the City of New York, have authority to go upon the poles bearing electrical conductors in streets where the Mayor has been requested to remove the same for any purpose whatsoever, except to remove the said poles and electrical conductors in conformity with law. The streets and avenues referred to are the following:

Broadway, from 14th to 45th Streets,
19th Street, from Sixth to Fifth Avenues,
23d Street, from Sixth to Fourth Avenues,
24th Street, from Sixth Avenue to Broadway.
25th Street, from Sixth Avenue to Broadway.
26th Street, from Sixth Avenue to Broadway.
27th Street, from Sixth Avenue to Broadway.
28th Street, from Sixth Avenue to Broadway.
42d Street, from Sixth Avenue to Broadway.
Sixth Avenue, from 18th to 50th Streets.

Third. On all other streets and avenues companies may make repairs; but this does not include the placing of new poles, the stringing of new wires, or the making of new connections, except upon a written permit as aforesaid.

You are respectfully requested to cause the arrest of all persons found violating these provisions, which the Board hopes are sufficiently simple to be readily understood by your officers.

Thanking you sincerely for your co-operation with the efforts of the Board in the past, and fully anticipating the most favorable results from our joint efforts in the future, I have the honor to be,

For the Board,

THEODORE MOSS, Secretary.

Unanimously adopted.

[JUNE 8, 1888.]

The following communication was read and ordered to be spread on the minutes:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,

18 CORTLANDT STREET, NEW YORK, N. Y., June 8th, 1888.

To the Honorable, the Commissioners of the Board of Electrical Control,
1218 Broadway, New York City, N. Y.

GENTLEMEN:—In order to meet the requirements of the Telephone and Telegraph Companies, I would respectfully suggest that the Board of Electrical Control authorize the construction of the following lines during the present season, of the material specified below:

First. The extension of the Frankfort Street line, from Pearl to Water Streets; about 7,800 feet of single duct.

Second. The Cortlandt Street line, from Church to West Streets; about 10,500 feet of single duct.

Third. A line on John Street, from Front Street to Broadway, of which a short section from Broadway to a manhole opposite the present Telephone Exchange was built last year.

Fourth. A line commencing at the corner of Beekman Street and Gold Street; along Gold Street, Ann Street and Nassau Street to John Street, where it connects with the preceding; about 11,470 feet of single duct.

All of the above line to be built of wrought iron pipe laid in hydraulic cement concrete. It is important that immediate action be taken, as the Franklin Street line is in course of construction, and the extension required is to carry it to the Telephone Station of the Brooklyn Bridge cable crossings.

The line on John Street is also required at once. I am,

Very respectfully yours,

ED. LAUTERBACH, President.

Commissioner Gibbens, after obtaining a favorable report from Engineer Kearny as to the suggestions of the communication last read, moved the following resolution:

Resolved, That this work suggested in the communication of the Consolidated Telegraph and Electrical Subway Company be authorized, subject to the decision of the Engineer as to the number of ducts required in the localities specified.

Unanimously adopted.

The following application was read:

NEW YORK, June 4th, 1888.

To the Board of Electrical Control:

Permission is hereby requested by the Metropolitan Telephone and Telegraph Co., operating Electrical Conductors in the City of New York, to change the location of a pole from the north side of Franklin St. and Varick St., to the south side, as shown

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on annexed diagram. The City have removed a gas lamp for the purpose, but the Board of Public Works think we should first obtain your consent.

Subject to the Rules and Regulations of the Board.

Very respectfully yours,

W. A. VAIL, Gen. Supt.

Commissioner Gibbens moved the following resolution:

Resolved, That the Metropolitan Telephone and Telegraph Company be authorized to move a pole as indicated on the diagram accompanying the application just read, subject to the Rules and Regulations of the Board, and provided the Company obtain the consent of the property owners.

Unanimously adopted.

Commissioner Gibbens stated that there were applications of the United States Illuminating Company before the Board for permission to place new wires on their poles, and so on, and that there was a regulation of the Board to the effect that applications from companies who are in contempt of the requests of the Board will not be considered, and he moved to lay them on the table. There being no objection, President Hess so directed.

The following communications were read:

MAYOR'S OFFICE,

NEW YORK, June 5, 1888.

THEODORE MOSS, ESQ., Secretary:

SIR:—I transmit herewith a communication from Samuel Fitzpatrick, and others, in reference to the dangerous condition of the electric wires at or in the neighborhood of the house No. 250 East 124th Street, for such action as your Board may see fit to take.

Yours respectfully,

ABRAM S. HEWITT, Mayor.

NEW YORK, June 4th, 1888.

A. HEWITT, Mayor of New York City.

DEAR SIR:—We, the undersigned people, citizens of the United States, appeal to your honor, to save the lives of the tenants of the house No. 250 East 124th Street. On the roof of this house are electric wires fastened to the washpoles, so low that small children can reach them with their hands. 16 families live in this house, and many a mother takes her children with her up on the roof.

All these wires are in a bad condition, and some of them are without any covering. A wonder it is that no accident has happened up to the present time.

Hoping that something will be done in this matter,

We remain with all possible regards,

SAM FITZPATRICK,

OTTO DRASTE,

MRS. L. MEYER, Housekeeper.

Commissioner Gibbens—The Secretary has replied that the Board would investigate the matter, and take whatever action seemed necessary. The Secretary directed the Engineer to investigate, and the Engineer makes this report:

NEW YORK, June 7, 1888.

THEO. MOSS, Esq., Secretary.

DEAR SIR:—I have this day examined the wires on the roof of 250 East 124th Street, referred to in the complaint of tenants, etc., and find that there is no electric light wire on the roof building mentioned.

There are some messenger service wires and telephone wires, which I think the complainant mistook for electric light wires.

Very respectfully,

HENRY S. KEARNY, Engineer.

Commissioner Gibbens—I would like to call attention to the fact that the letter does not say "electric light wires," but simply says "electric wires," and that the wires are within the reach of children who play on the housetops. Now, there is a regulation of the Board to the effect that no wires must be strung within seven feet of the roofs of houses. The Commissioner further stated that, if the Board would allow him, he would take charge of the matter and report at the next meeting.

Commissioner Gibbens offered the following resolution:

Resolved, That the Engineer of the Board be directed personally to inspect the subway system so far as constructed, section by section, and report in detail to the Board the condition thereof, and that the Consolidated Telegraph and Electrical Subway Company be instructed to furnish the Engineer with every facility for the completion of the work.

Unanimously adopted.

Commissioner Gibbens read from the Evening Post of June 5th, 1888, a letter, as follows, on the subject of electric light wires, written by Harold P. Brown, Electrical Engineer, of 201 W. 44th Street, New York, in which the writer concludes by advising that the Board of Electrical Control adopt certain rules for station lighting:

To the Editor of the Evening Post:

SIR:—The death of the poor boy Streiffer, who touched a straggling telegraph wire on East Broadway on April 15, and was instantly killed, is closely followed by the death of Mr. Witte in front of 200 Bowery and of William Murray at 616 Broadway on May 11, and any day may add new victims to the list. After every such accident the newspapers clamor to have the wires placed under ground, while the electricians connected with the system at fault hold their peace or throw the blame on the telephone wires, until the matter has been forgotten. As an electrical engineer I know that burying the wires would not remedy the trouble, though it would largely diminish the risk, while the enforcement of a few common-sense regulations would make it

almost impossible to kill a man from an arc light current. It will not do for electricians to state that they "don't know what killed that man," for unless they take prompt measures to make their business safe some terrible accident will cause the adoption of laws to regulate electric lighting, which, being framed by their enemies, will cripple or destroy their business.

So, at the risk of offending some corporations having heavy investments in unsafe systems, I will venture to state a few facts which I trust the press will be kind enough to publish widely, as no disinterested electrician will deny my statements.

It is well known that a continuous current of "low tension" such as is used by the Edison Company for incandescent lights, is perfectly safe as far as life risk is concerned. From this fact the false popular impression has arisen that all incandescent systems are safe and all arc systems dangerous. But it is not to the "low tension" alone that this current owes its safety, since a factor fully as important is the even, steady quality of its delivery. That is, a current of "high tension" but unbroken and continuous, may be perfectly safe if properly operated, while a current of lower "tension," but wavy or pulsating, is always dangerous. And when these pulsations rise in speed and intensity the danger increases, until the climax is reached in what is called "alternating current," in which impulses are given first in one direction and then in the other several thousand times a minute.

To understand the reason for this it is necessary to remember that when a current through a wire or other conductor is made or broken, a current in the opposite direction is "induced" in any parallel conductor; the same effects are produced in a less degree when the first current pulsates, but are intensified when it is alternated or reversed in direction. Any one who has held the metal handles of a "medical" (Galvano-Faradaic) battery, has had a practical experience of the power of induction and pulsation; in this apparatus the current from the battery itself is so feeble that it cannot be detected without the use of instruments, except by the metallic taste when the terminals are touched by the tongue. This insignificant current is passed through a short piece of insulated wire coiled around an iron core, and is interrupted by a rapidly vibrating armature, thereby inducing in another and longer coil of wire surrounding the first a series of shocks whose intensity can produce most intense suffering or even death in a human being who forms a portion of the circuit. It is this rapid succession of shocks that kills, while a single steady impulse of the same intensity would do little damage.

Two of the leading arc-lighting systems have dynamo-electric generators provided with what are known as "open-circuit armatures," which produce a pulsating current somewhat similar in kind to the one just described, though a thousand times more powerful. It is to this current that nearly all the deaths caused by arc-lighting systems must be attributed. These "open-circuit armature" systems were pioneers in electric lighting, and at the time they were invented it was supposed that the "closed-circuit armatures," which produce the steady and safer current, could not be made to develop sufficient electro-motive force to operate a number of arc lamps upon one circuit. But the recent advances in the science have made possible "closed-circuit armature" generators which give the same amount of current and electro-motive force, with a much less expenditure of motive power, so that there is now no valid reason for the existence of the old type with its pulsating and dangerous current.

I do not mean to have it understood that the "steady" current is always safe or that the "pulsating" is always unsafe, for any current with more than fifty arc lamps in series is dangerous and should be prohibited; while the "pulsating" current, if its

circuit is kept thoroughly insulated and carefully watched, and tested every day, may run for years without a fatal accident. But the fact remains that the "steady" current, with fifty or less lamps in circuit, has had, to my knowledge, but four victims against the scores killed and maimed by the "pulsating" current. And even these four were responsible for their fate, since all were employees and should have known better. Three of them tried to disconnect apparatus through which they knew the current was flowing, and thus got into the circuit, while the fourth received the full current while trying to repair a broken wire which he knew was charged.

But the persons killed by the other system, as a general thing, have been in no way responsible for the accidents that caused their deaths; they have, as did young Streiffer, touched or run against an apparently harmless wire when standing on a damp place, or have touched at the same moment some metal accidentally charged with the fatal current, and some other conductor having a "ground" connection, as did Mr. Witte. I do not believe with extremists that the "pulsating" current should be prohibited, but I do think that the conditions of safety should be rigidly enforced by the authorities.

If the current carrying the "pulsating" current is perfectly insulated at all times, no accident is likely to occur. But if, through wearing of the insulation or a heavy rain, a connection between the circuit wire and the "ground" is formed, any one who touches the wire and a "ground" will receive a portion of the current; if he happens to be near the other "ground," he receives but a small shock, but if there are a number of lamps between him and the other connection, the shock may be fatal.

Of course the reply will be made that all the arc-lighting stations in this country use insulated wire, "as required by the underwriters," but here is just where a great mistake has been made, and the sooner this is corrected the better for the cause of electric lighting. It is an open secret among electricians that the wires known as "underwriter's wire" has a very poor insulation, even when new and during dry weather, but practically no insulation at all during a rain. The paint dries out of it after a few months' exposure, other wires rubbing against it soon wear away the cotton and expose the metal, and it is altogether unfitted for outdoor use. Among electric-lighting men it is appropriately called "underwriter's wire," and the frequent fatalities it causes justify the name.

Even with the most conscientious electric-light superintendent, who tests his circuit carefully for "grounds" every day, before starting the generators, there is no surety that during the run some telegraph wire may not drop upon his circuits, wear away the insulation, and set a death-trap for the unwary who may be miles away from an electric lamp.

The condition of the electric light circuits in the lower part of the city is simply disgraceful, as has been previously pointed out. Most of them were first put up years ago; they have been cut and patched until full of joints, from which the tape flutters; the insulation is entirely worn off in places or hangs in shreds, and few circuits are fit to run with safety for a single hour. They cross and recross the structures of the elevated roads; they sag and sway in loose loops, and are intersected at all levels by telephone and telegraph wires. On some of these circuits two or more dynamos are run in series, thus more than doubling the life risk, and it is almost certain that it was these overloaded circuits that killed Streiffer and Witte.

If the Board of Electrical Control cannot force the wires underground, they can at least condemn these lines, which the companies can afterwards utilize by reinsulating for their underground circuits. The underwriters ought to have an eye to this also, for every bare or poorly insulated spot is a menace to property as well as life.

But if "influence" prevents the wires from being replaced, and it seems to permit the extension of new wires elsewhere, there are a few simple precautions which, if enforced, will make fatal accidents almost impossible. All the deaths due to arc lighting, as far as reported, have been caused by the victim's breaking the circuit and placing himself in the break to receive the fatal "extra-current" thus caused, or by his making a "ground" connection with a circuit on which there was another "ground." Both of these dangers can be avoided by very simple apparatus.

If a voltmeter, or a circuit of very high resistance, be connected across the poles of every arc-light dynamo, the external circuit may be opened without producing the death-flash, as most of the "extra current" will go through the by-pass. This would prevent a large proportion of the fatal accidents. If every arc-light dynamo was also provided with a wire of very high resistance leading from the circuit to the "ground," upon which was interposed apparatus to shut off the production of current the instant a second "ground" occurred, no deaths could be caused except by foolhardy carelessness. The latter apparatus could also be used to shut down the current in case the external circuit should be broken.

With these precautions, and with the number of lamps limited to fifty on a single circuit, even the "pulsating" current would be fairly safe, but as the stations are now operated upon circuits with frayed and worthless insulation, they are a constant menace to all who walk the streets, use a telephone, or touch a wire.

In regard to the popular impression that all incandescent electric lighting systems are safe, I am sorry to say that recently several companies who have more regard for the almighty dollar than for the safety of the public, have adopted the "alternating" current for incandescent service.

If the "pulsating" current is dangerous, then the "alternating" can be described by no adjective less forcible than damnable. With the "pulsating" current three contingencies must ordinarily arise to produce fatal results: there must be a "ground" connection on the circuit; a person must touch the circuit at some distance from the first "ground," and must at the same instant be in connection with the "ground" himself. But the "alternating" current produces fatal results by simply touching the two parallel wires, always close together, connections from which enter every house. Its supporters may say that on account of its danger they do not permit the "primary" or death-current, to enter the house, but supply the lamps from the "secondary" current. True, but between these two circuits is interposed nothing more than a thin layer of cotton or silk insulation, and, as has happened again and again, it requires but a flash of lightning or a little moisture in the converting apparatus to bring the death-current to each lamp.

The only excuse for the use of the fatal "alternating" current is that it saves the company operating it from spending a larger sum of money for the heavier copper wires, which are required by the safe incandescent systems. That is, the public must submit to constant danger from sudden death in order that a corporation may pay a little larger dividend. I do not know of a single disinterested electrician of high standing who does not condemn the alternating system. Siemens & Halske, a firm

of electricians with a world-wide reputation, have spent years of experiment upon it, but have abandoned it as unsafe, and say that its use should be prohibited by law.

Following the example of Chicago, the Board of Electrical Control should forbid the use of the fatal alternating current, and legislatures, city councils, and life-insurance managers should see to it that stringent laws and regulations be passed to prevent this wholesale risk of human life. The placing the wires of the alternating system under ground would only intensify the danger in houses where it might be used, while its use with underwriter's wire in a city like this is as dangerous as a burning candle in a powder factory. If the death of these three men can effect the adoption and enforcement of regulations similar to the following, they will not have died in vain.

RULES FOR STATION LIGHTING.

Not more than fifty arc lights shall be operated upon any one circuit, unless said circuit is used exclusively for street lamps mounted upon wooden poles; in this case the number must not exceed sixty.

All outdoor arc-light circuits must be provided with waterproof covering having an insulation resistance of not less than one-half a megohm. Any circuit falling below this must not be used until restored.

No arc-light dynamo shall be operated unless provided with a voltmeter across its terminals, or other device, to provide a path for the extra-current caused by opening the external circuit.

No arc-light dynamo shall be operated unless provided with means for automatically stopping the production of current the instant a ground connection is made upon its circuit.

No arc-light dynamo shall be operated unless provided with means for automatically breaking or short-circuiting the field circuit the instant the external circuit is broken, in order to prevent a current from being built up by the broken circuit ends falling upon some conductor.

No alternating current with a higher electro-motive force than three hundred volts shall be used.

HAROLD P. BROWN, Electrical Engineer,

201 West Fifty-fourth street, New York, May 24.

Commissioner Gibbens moved the following resolution:

Resolved, That the rules suggested by Mr. Brown be published in the minutes; that marked copies be sent to the superintendents of the different electric light companies of the city, to the Westinghouse Company, which proposes to use alternating currents, to Mr. Park Benjamin, who drew up the Rules and Regulations of the Commission, to Mr. Ralph W. Pope, who has frequently aided the Commission by his advice, to Professor Plympton, of the Brooklyn Commission; and that accompanying the marked copy of the rules as proposed by Mr. Brown, the Secretary be directed to invite the attention of these gentlemen to these proposed rules and regu-

lations, and to ask them to give the Board such a reply on the subject as they may see fit, either in writing or by appearing before the Board to discuss the matter; and that in order that Mr. Brown may have a chance to meet with these gentlemen, if he so desires, that the same be sent to him.

Unanimously adopted.

Resolved, That a copy of the verdict of the Coroner's Jury in the case of the death of Thomas Murray be spread on the minutes.

Adopted. Vote: Commissioners Gibbens and Moss, "aye." President Hess, "no."

The following is a copy of the verdict.

We find that the death of Thomas Murray proceeded from an electric shock, received from an improperly insulated light wire, operated and controlled by the Brush Company, while in the discharge of his duty as a lineman in the employ of said company, on 11th of May, 1888, at 616 Broadway, N. Y.

We also find, from the evidence, that said wire was not in use, had not been in use for about four months prior to May 11th, and was permitted to remain a live wire in a dangerous condition and position.

We therefore find the Brush Company responsible for the death of Thomas Murray.

We strongly condemn the parsimonious spirit of the Electric Light Companies in maintaining a constant menace to life and property, by not keeping their wires in repair with proper methods of insulation.

We would recommend that the Coroner immediately call the attention of the District Attorney to the illegal maintenance of the wires above ground in this City.

JOHN T. LYNCH,
JOHN P. LEO,
WM. E. MONTAUX,
SAMUEL WEIL,
E. D. FARRELL,
DAN'L DILLON,
ISAAC BLUMENTHAL,
S. M. WARREN,
JOHN BORKELL,
L. J. CALLANAN,
D. HENRY KNOWLTON.

JUNE 5, 1888.

Resolved, That when the Board adjourns it adjourns to meet at this office on Monday, June 11th, 1888, at 11 o'clock, A. M.

Unanimously adopted.

Assemblyman O'Connor, representing the Central Taxpayers' Association, appeared before the Board and made a verbal protest against the granting by this Board of any permits to string wires in certain districts in Harlem.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Monday, June 11th, 1888, at 11 o'clock A. M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The following candidates, reported to this Board by the State Civil Service Board as eligible for appointment, appeared, in response to the resolution passed at last meeting:

For Inspectors of Electrical Conductors—F. J. Fitzpatrick, M. S. Keys.

For Inspectors of Underground Construction—William Mitchell, H. E. Barton and Leonard H. Wager.

For Electrical Experts—Schuyler S. Wheeler, George P. Wardell and Edward M. Waring.

And after examination were directed to appear at the next meeting.

The following application was read:

NEW YORK, June 11th, 1888.

The Board of Electrical Control, 1218 Broadway, New York City:

GENTLEMEN:—This Company respectfully ask permission to repair wires and trim lamps on Broadway from 14th to 34th streets, pending the placing of cables in the conduit.

Yours respectfully,

BRUSH ELECTRIC ILLUMINATING CO.,

W. H. M'GRATH, Superintendent.

Superintendent McGrath, of the Brush Co., stated that a cable would be ordered by his Company to-day under a guarantee to furnish it in three weeks.

Commissioner Gibbens offered the following resolution:

Resolved, That a permit to renew and repair and to keep in repair, according to the rules and regulations of the Board, the lines of the Brush Electric Illuminating Company along the streets where they have been ordered underground be granted for

three weeks, and at the end of that time, when Superintendent McGrath shows us the substantial evidence of his company's good faith in carrying out the programme agreed upon, the permit can be renewed for such a time as may be necessary.

Unanimously adopted.

The following applications were read:

NEW YORK, June 2d, 1888.

To the Board of Electrical Control:

Permission is hereby requested by the Mount Morris Electric Light Company to erect carrying poles and string wires on 8th avenue, from 122d to 135th street, on 125th street from 3d avenue to Manhattan street, and on 3d avenue from 110th to 130th street to connect circuits and stations. Subject to the Rules and Regulations of the Board.

Very respectfully,

C. H. SEWALL.

NEW YORK, June 2d, 1888.

To the Board of Electrical Control:

Permission is hereby requested by the Mount Morris Electric Light Company to erect carrying poles and string wires on

Barclay street, from Broadway to West street.
Chambers street, from Broadway to West street.
Greenwich street, from Battery Place to Canal.
West street, from Battery Place to Canal.
Washington street, from Fulton street to Canal.

To connect circuits and station. Subject to the Rules and Regulations of the Board.

Very respectfully,

C. H. SEWALL, Secretary.

Commissioner Gibbens moved the following resolution in reference to the foregoing application:

Resolved, That the plans proposed by the Mount Morris Electric Light Company, with all its details, be submitted by that company to the Engineer of the Board and Mr. E. A. Leslie, so that they may report on Wednesday next whether the plan proposed, with its details, is in accordance with the rules and regulations of the Board, in the first place; and secondly, whether it is practically a safe way in which to place wires overhead.

Unanimously adopted.

The following communication was read:

NEW YORK, June 9th, 1888.

Board of Electrical Control, 1218 Broadway, City:

SIRS:—Your letter, dated to-day, at hand and contents noted.

It will please us to receive another copy of the Rules and Regulations of the Board and what sections of the same we do not comply with.

On receipt of your reply we will give the matter our immediate attention.

Trusting the above will receive your consideration and reply,

We are, yours truly,

THE HARLEM LIGHTING CO.,

B. J. B.

President Hess directed that another copy of the rules and regulations be sent to the Harlem Lighting Company.

The following communication was read:

NEW YORK, June 8th, 1888.

THEODORE MOSS, ESQ., Secretary, etc.:

DEAR SIR:—I am directed by the Board of Police to acknowledge receipt of your letter of the 6th inst., calling attention "to violation of Regulations by connection being made with wires of the U. S. Illuminating Co. in front of 1158 Broadway, and asking co-operation of Police in preventing further violations," and to state that the same has been referred to the Superintendent to enforce the law.

Very respectfully,

WM. H. KIPP, Chief Clerk.

Commissioner Gibbens:—The superintendent of the Brush Company (which is no longer in the position it was yesterday) desires that its application dated April 11th, 1888, to set supporting poles for city lighting in certain streets therein specified, shall be considered, and I move the following resolution:

Resolved, That the committee which have been called upon to report in regard to the applications of the Mount Morris Electric Light Company, also report in regard to the application of the Brush Electric Illuminating Company.

Unanimously adopted.

Commissioner Gibbens also offered the following resolution:

Resolved, That when the Board adjourns it adjourns to meet at this office on Wednesday, June 13th, 1888, at 11 o'clock, A. M.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Wednesday, June 13th, 1888, at 11 o'clock, A. M.

The reading of the minutes of the last meeting was dispensed with.

The following communication was read and ordered to be spread on the minutes:

NEW YORK, June 11th, 1888.

The Board of Electrical Control, 1218 Broadway, New York:

GENTLEMEN:—At a meeting of the Directors of the Brush Electric Illuminating Co., held this day, the following resolution was passed (a full meeting of the Board being present):

"Resolved, That the Executive Officers of the Brush Electric Illuminating Co. be and are hereby authorized to contract with one of the two Companies, whose proposals they have, to furnish Cables for Electric Light purposes, for use in the subway or conduit in Broadway, from 14th street to 34th street, now ready, whichever they deem best."

By Order of the Board,

Respectfully yours,

G. M'FALL, Secretary.

The following application was read:

NEW YORK, June 13th, 1888.

To the Board:

GENTLEMEN:—You are respectfully requested to pass a resolution permitting the Western Union Company to make repairs of its lines on 6th avenue and Broadway, pending the placing of wires underground on these streets, which will be undertaken immediately and carried on as rapidly as possible.

Very respectfully,

For the Western Union Telegraph Co.,

A. S. BROWN, Superintendent.

Commissioner Gibbens moved the following resolution:

Resolved, That the application of the Western Union Telegraph Company "to make repairs of its lines on Sixth avenue and Broadway pending the placing of wires underground on these streets" be granted.

Unanimously adopted.

[JUNE 13, 1888.]

The following communication was read:

NEW YORK, June 12th, 1888.

To the HONORABLE THEODORE MOSS, Secretary of the Board of Electrical Control,
1218 Broadway, New York City:

DEAR SIR:—I beg to acknowledge receipt of your valued favor of the 11th inst., advising me of the resolutions of the Board, submitting to your Engineer and myself for report the plans proposed by the Mount Morris and Brush Electric Light Companies.

In order to make a satisfactory and intelligent report, the subject demands considerable time and attention, which, I regret to say, owing to my preoccupation with other important matters, I am at present unable to give it. Trusting, therefore, that you will excuse me and thanking you for the distinction conferred, I am, dear sir,

Yours very respectfully,

E. A. LESLIE.

Commissioner Gibbens, after stating that Engineer Kearny was not ready to report on the matter referred to him and Mr. Leslie at the last meeting, moved the following:

Resolved, That the matter of the application of the Mount Morris and the Brush Electric Light Companies be laid on the table until the committee report.

Unanimously adopted.

The following communications from the Secretary of the Board were read and ordered to be spread on the minutes:

NEW YORK, June 12th, 1888.

HON. JOHN NEWTON, Commissioner of Public Works, 31 Chambers street, City:

DEAR SIR:—The Board is informed that it has been decided that the amounts appropriated by the Board of Estimate and Apportionment for the Bureau of Incumbrances are available for the removal of dead wires, poles, fixtures and other devices not in use, where the same are not removed by the owners in accordance with the Regulation of the Board passed nearly a year ago.

The Board will be glad to assist you in every way in its power in locating these obstructions, and will notify you, from time to time, from the reports of its inspectors, as to cases where action on your part seems proper.

Hoping that through your co-operation in this matter the best results will be attained, I am

Very respectfully,

THEODORE MOSS, Secretary.

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NEW YORK, June 12th, 1888.

HON. JOHN NEWTON, Commissioner of Public Works, 31 Chambers street, City:

DEAR SIR:—Permit me to respectfully call attention to the fact that an iron telegraph pole is and has for nearly ten years been standing at the southwest corner of 23d street and Broadway, without any ostensible object, inasmuch as no electrical conductors are attached.

The Regulations of the Board of Electrical Control provide that all poles, fixtures and devices not in use and all dead wires shall be removed from the streets, avenues and highways of the city.

The Board is unable to ascertain and notify the owner and is of the opinion that it will be extremely difficult to get anybody to acknowledge its ownership. It seems to be a case where it would be extremely proper for your Department to make the removal, and you are respectfully requested to take such action as seems proper.

Very respectfully,

THEODORE MOSS, Secretary.

Commissioner Gibbens moved the following resolution:

Resolved, That William Mitchell, Henry E. Barton and Leonard H. Wager be appointed as Inspectors of Underground Construction on probation.

Unanimously adopted.

The following resolution, adopted April 17th, 1888, under which the appointments of Inspectors of Underground Construction are made, was directed to be spread on the minutes:

Resolved, That the Secretary is directed to request the State Civil Service Board to certify to this Board the names of persons applying for examination who shall be found suitable and qualified to fill the positions of four Inspectors of Underground Construction. The said inspectors, after appointment by this Board shall report for duty to the Engineer who shall assign and instruct them in the supervision of the work done by the Consolidated Telegraph and Electrical Subway Company, which company shall pay said inspectors monthly at the rate of \$4 per diem for such time actually spent in the supervision of subway construction, as shall be certified to by the Engineer of the Board in the manner now in vogue as to the Inspectors of the Department of Public Works assigned to similar duty.

Commissioner Gibbens offered the following resolution:

Resolved, That the men who have been selected as Inspectors of Underground Construction be notified to report to the Engineer to-morrow morning for duty.

Unanimously adopted.

Resolved, That Mr. F. J. Fitzpatrick be appointed as Inspector of Electrical Conductors on probation.

President Hess moved the following substitute:

Resolved, That Mr. Malcolm S. Keyes be appointed as Inspector of Electrical Conductors on probation.

President Hess, after some discussion, withdrew his substitute, and the resolution of Commissioner Gibbens was adopted, President Hess voting "no."

Commissioner Moss moved the following resolution:

Resolved, That Mr. Malcolm S. Keyes be appointed as Inspector of Electrical Conductors on probation.

Unanimously adopted.

Commissioner Gibbens moved the following resolution:

Resolved, That Mr. R. J. Reilly be appointed as Inspector of Electrical Conductors on probation.

President Hess offered the following resolution:

Resolved, that the resolution for the appointment of R. J. Reilly be laid on the table.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to request the State Civil Service Commission to send further names for the position of Inspector of Electrical Conductors, in accordance with their regular rule on that matter.

Unanimously adopted.

Resolved, That Schuyler S. Wheeler be appointed Electrical Expert of the Board on probation:

President Hess offered the following resolution:

Resolved, That the resolution of Commissioner Gibbens for the appointment of Schuyler S. Wheeler as Electrical Expert be laid on the table until the next meeting.

Adopted. Vote—Commissioners Hess and Moss "aye"; Commissioner Gibbens "no."

Commissioner Gibbens offered the following resolution:

Resolved, That the Inspectors of Electrical Conductors who have been selected by the Board be directed to report to the Secretary of the Board to-morrow at 11 o'clock A. M., for duty.

Adjourned to Friday, June 15th, 1888, at 3 o'clock P. M.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Friday, June 15, 1888, at 3 o'clock P. M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens, Theodore Moss.

Commissioner Gibbens moved the following resolutions:

Resolved, That the reading of the minutes of the last meeting be dispensed with.

Unanimously adopted.

Resolved, That the printing of the minutes be discontinued.

Adopted. Vote—Commissioners Gibbens and Moss "aye"; Commissioner Hess "no."

Commissioner Gibbens called from the table his resolution laid on the table at the last meeting as follows:

Resolved, That Schuyler S. Wheeler be appointed Electrical Expert of the Board on probation.

Unanimously adopted.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Secretary be directed to certify to the State Civil Service Board as appointees of this Board on probation the names of Robert J. Reilly and George W. Roth, sent to this Board as having passed the Civil Service examination with a general standing of 95 and 81 respectively, and to notify said inspectors to report for duty Saturday, June 16th, 1888, at 11 o'clock A. M.

Unanimously adopted.

Resolved, That on and after the 1st of July, 1888, no company shall do business of electric lighting without a certificate from the Expert as to the machinery and plant used; and after the 15th of July, 1888, no company shall do such business without a certificate that its conductors are everywhere in accordance with the Rules and Regulations of the Board.

Unanimously adopted.

Commissioner Moss offered the following resolution:

Resolved, That permission be granted to the Mount Morris Electric Light Company to erect carrying poles and to string conductors of the second class, on streets and avenues where it has obtained city or commercial contracts (Third Avenue and 125th Street east of Third Avenue excepted): Provided,

First. Said Company shall agree to obey all the rules and regulations of the Board of Electrical Control and to place its conductors in subways where the same shall be provided, and will remove forthwith its conductors and fixtures from said streets and avenues when ordered to do so by the Board.

Second. The conductors to be used, together with fixtures, poles, insulation and mode of construction, shall be approved in writing by the Engineer and Electrical Expert of the Board.

Third. Said company shall agree not to run its plant without a certificate of inspection from the Expert of the Board, nor to alter its plant after inspection, except on notice to the Board; the understanding being that while the plant remains in the same condition as at the date of the certificate that document is valid.

Adopted. Vote—Commissioners Hess and Moss "aye"; Commissioner Gibbens "no."

Commissioner Hess offered the following resolution:

Resolved, That the application of the Brush Electric Illuminating Company to set supporting poles to carry two wires for city lighting, on Second Avenue, be granted. Provided,

First. Said Company shall agree to obey all the rules and regulations of the Board of Electrical Control and to place its conductors in subways when the same shall be provided, and will remove forthwith its conductors and fixtures from said streets and avenues when ordered to do so by the Board.

Second. The conductors to be used, together with fixtures, poles, insulation and mode of construction, shall be approved in writing by the Engineer and Electrical Expert of the Board.

Third. Said Company shall agree not to run its plant without a certificate of inspection from the Expert of the Board, nor to alter its plant after inspection except on notice to the Board, the understanding being that while the plant remains in the same condition as at the date of the certificate that document is valid.

Adopted. Vote—Commissioners Hess and Moss "aye"; Commissioner Gibbens "no." (Reconsidered.)

Commissioner Gibbens stated that he had been called during the morning to attend a session of the Jefferson Market Police Court, before which a lineman for the United States Illuminating Company was being charged for violation of the rules and regulations of the Board, inasmuch as he had attempted to repair—place a carbon in a commercial lamp in front of 1153 Broadway. The Judge discharged the lineman, with a warning to the Superintendent of the Company that in case of another arrest of the same man for violation of the rules and regulations of the Board which requires a permit for all maintenance of lines, and so on, he would send him to the

General Sessions for a misdemeanor. The Judge advised the United States Company to come to the Board and get a permit to make these repairs and to comply with the regulations of the Board. The Superintendent of the Company is here and asks for a permit to repair his lines, and he tells me that its President has informed him that everything is being done to enable it to comply with the regulations of the Board. Inasmuch as we have no reason to doubt the good faith of this Company, and inasmuch as it is proper that we should, as long as they are earnestly attempting to carry out our requests, allow it to conduct its business, he would offer the following resolution:

Resolved, That a permit be granted to the Superintendent of the United States Illuminating Company to repair and maintain the lines of said Company on streets and avenues where subways have been provided, for two weeks from to-day, inasmuch as said Company has agreed to go into the subways as soon as possible; the understanding being that said Company will comply with all the rules and regulations of the Board, and will offer substantial evidence of its good faith as to going underground before the expiration of the period designated, in which case the permit may be extended.

Unanimously adopted.

Commissioner Hess, after stating that in offering the resolution granting permission to the Brush Electric Illuminating Company to erect carrying poles he had misnamed the locality in which that Company asked to erect these poles, and that he desired to offer a substitute, moved the following resolution:

Resolved, That the resolution passed at this meeting granting permission to the Brush Electric Illuminating Company to set supporting poles to carry two wires for city lighting be reconsidered.

Unanimously adopted.

Commissioner Hess thereupon offered the following substitute:

Resolved, That the application of the Brush Electric Illuminating Company to set supporting poles to carry two wires for city lighting,

On Avenue B, from 14th to 22d Streets.

On Irving Place, from 16th to 20th Streets.

On Grand Street, from Broadway to Sullivan Street.

On First Avenue, from 14th to 59th Streets.

On 8th Street, from Third to First Avenues, be granted. Provided,

First. Said company shall agree to obey all the rules and regulations of the Board of Electrical Control and to place its conductors in subways when the same shall be provided, and will remove forthwith its conductors and fixtures from said streets and avenues when ordered to do so by the Board.

Second. The conductors to be used, together with fixtures, poles, insulation and mode of construction shall be approved in writing by the engineer and Electrical Expert of the Board.

Third. Said Company shall agree not to run its plant without a certificate of inspection from the Expert of the Board, nor to alter its plant after inspection except on notice to the Board; the understanding being that while the plant remains in the same condition as at the date of the certificate that document is valid.

Adopted. Vote—Commissioners Hess and Moss "aye"; Commissioner Gibbens "no."

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to reply to a letter from Francis M. Scott, Assistant Corporation Counsel, and that it be placed on the minutes.

Unanimously adopted.

Letter of Francis M. Scott:

NEW YORK, June 14th, 1888.

JACOB HESS, ESQ., President Board of Electrical Control, 1218 Broadway.

SIR:—Will you be so kind as to furnish me with the following dates:

First. Date of appointment of yourself and Messrs. Loew and Moss by the Mayor, Comptroller and Commissioner of Public Works.

Second. Date of death of Commissioner Loew.

Third. Date of appointment of Commissioner Flower.

Fourth. Date of resignation of Commissioner Flower.

Fifth. Date of appointment of Commissioner Gibbens.

I desire this information for use in a proceeding which the Counsel to the Corporation is about to institute, and as to which I will forward an affidavit for your verification in a few days.

Yours very truly,

FRANCIS M. SCOTT, Assistant Counsel to the Corporation.

Adjourned

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Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Monday, July 2d, 1888, at 3 o'clock P. M.

Present: Commissioners Hess, Gibbens and Moss.

The minutes of the last meeting were read, and, on motion of Commissioner Moss, approved as read.

The following communication was read:

NEW YORK, June 29, 1888.

THEODORE MOSS, ESQ., Sec'y Board of Electrical Control, cor. Broadway and 30th St.

MY DEAR SIR: It becomes necessary to show in an action now pending that your Board has never granted any permit to a company known as the "New York Electric Construction Company."

Will you kindly verify the enclosed affidavit and return to me at your earliest convenience.

Yours very truly,

FRANCIS M. SCOTT, Ass't Counsel to the Corporation.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be advised to verify the affidavit enclosed with the communication just read and return it to the Corporation Counsel.

Unanimously adopted.

The following communications were read:

"THE UNITED STATES ILLUMINATING CO.

"59 and 61 LIBERTY ST.,

"NEW YORK, June 19th, 1888.

"THEODORE MOSS, ESQ., Secretary, Board of Electrical Control, 1218 Broadway, N. Y.

"DEAR SIR: We are in receipt of your communication of the 15th inst., containing a copy of a resolution of the Board of Electrical Control adopted on that day.

"We would respectfully reply that we are endeavoring to get some cable which will enable us to make an actual trial of the present subway ducts; but although we have obtained a number of specimens, we have been unable so far to get any cable manufacturer to give us any satisfactory guarantee as to cable intended to be used in such subway.

"We are entirely willing, just as soon as we can arrange to get proper cable, to make use of the present subway to ascertain whether the objections raised against its use as a duct for a street cable are insurmountable, but, of course, by doing this, we do not waive our position taken in respect to the subways as a sufficient system of

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subways within the meaning of the law, and we trust that you will accept this as sufficient evidence of our good faith to grant us the permit we desire in the meantime for repairs, etc.

"Your resolution goes too far in its recitals that we have agreed to go into the subways as at present constructed, and we have had an understanding with your Board as recited.

"We enclose a copy of a letter dated May 31, 1888, addressed to the Company by the Corporation Counsel of this City, and of our reply thereto, dated June 5th, 1888. That reply correctly states our position.

"Very respectfully yours,

"EUGENE T. LYNCH, President."

"NEW YORK, May 31, 1888.

"EUGENE T. LYNCH, ESQ., President United States Illuminating Company.

"DEAR SIR:—I have been instructed by the Mayor to cause proceedings to be instituted requiring your Company to enter subways and to remove your poles and wires from the streets. Before causing the necessary proceedings to be taken, I desire to be advised by you whether your refusal so far to do this arises from any objection to the sufficiency of the subways which have been provided, and if so, generally what your objections may be, and whether any attempt on the part of the Commissioners of Public Works, under proper authority to do so, to remove any of your poles and wires under the provisions of Chapter 716 of the Laws of 1887, is likely to be resisted by your Company.

"Yours respectfully,

"HENRY R. BEEKMAN, Counsel to the Corporation."

"THE UNITED STATES ILLUMINATING CO.

"59 and 61 LIBERTY ST.

"HON. HENRY R. BEEKMAN, Counsel to the Corporation.

"DEAR SIR:—In reply to your communication of the 31st of May, informing me that you have been instructed by the Mayor to commence proceedings requiring the United States Illuminating Company, of which I am President, to enter subways and to remove poles and wires from the streets, and asking to be advised as to the ground of our objection, I beg to refer you to the correspondence already had between our Company and the Board of Electrical Control on this subject, in which, and in our oral discussions with the Board and Engineer Beckwith, we have insisted and now insist that no sufficient subways have been constructed in the streets for the purpose required, and that no provision has been made for local connection of wires, and distribution of wires and lights along the blocks and on the opposite side of the streets through which the main subways are laid, rendering it impossible for us to make any use of the subway as constructed. We also have to say, that in other respects the provisions of Chapter 716 of the Laws of 1887 have not been complied with by the Board of Electrical Control, especially in view of the provisions of the previous statutes and laws referred to in that act.

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"In answer to your further question, whether any attempt on the part of the Commissioner of Public Works to remove our poles and wires is likely to be resisted by the Company, I would say, that we shall expect to maintain our property rights to such extent as the law affords protection in their exercise.

"Very respectfully yours,

"EUGENE T. LYNCH, President."

NEW YORK, July 2nd, 1888.

HENRY S. KEARNY, ESQ., Engineer Board of Electrical Control, New York City.

DEAR SIR:—Replying to your inquiry: We have closed a contract with the Brush Electric Illuminating Company of New York for one mile of our 8 conductor No. 4 Brown & Sharpe Gauge arc light cable and for placing the same underground in the New York Subways from 14th St. to 35th St. in Broadway; we have guaranteed this cable for its uses, and we are prepared to make and to guarantee similar cables for a reasonable period—say 18 months or two years. We may say here that the maximum electro-motive force of the Brush Electric Illuminating Company is given us at 2,000 volts.

Our confidence in our cables is based on their successful use in other cities for underground arc lighting.

Very respectfully,

STANDARD UNDERGROUND CABLE CO., per G. L. Wiley, Mgr.

Commissioner Gibbens stated that in view of the letters just read he had prepared some resolutions bearing on the subject, and he thereupon offered the following resolutions:

Resolved, That the Secretary be directed to send to the President of the United States Illuminating Company the following letter:

"NEW YORK, July , 1888.

"EUGENE T. LYNCH, ESQ., Pres. U. S. Illuminating Company, 59 Liberty Street, City.

"DEAR SIR: Your letters defining the position of your Company have been received and read at a meeting of the Board held on the day of July, 1888. In reply, I am directed to state for the Board:

"First. The Board is surprised at the evident lack of good faith shown by your Company in its relations with the Board, inasmuch as you have secured through the representations of your Superintendent and made use of a permit granted expressly and bearing on its face an evidence that it was granted expressly with the understanding that you were to conform to the requests of the Board and place your wires in the subways which have been constructed according to the Acts relating to electrical conductors in the City of New York, and have since, by your letters referred to, negatived the representations made as above, and now plainly show your intention to avail yourself of every possible pretext for disobedience to the will of the People, by whose favor your corporation came into existence and now lives.

"Second. The objections which you raise to occupancy of the subways and the removal of your conductors from the surface of the streets are illogical, untenable, inadequate, and will prove futile. They may be summed up and answered briefly:

"a. You complain that no general system of subways has been adopted by the Board in conformity with law. You are referred to section 3 of chap. 716 of the Laws of New York—(Whenever, in the opinion of the Board hereinbefore constituted, in any street or locality of, said city a sufficient construction of conduits or subways underground shall be made ready under the provisions of this act, reference being had to the general direction and vicinity of the electrical conductors then in use overhead,' etc.—which means that this Board, and not your Company nor any other corporation shall determine when you shall go underground; which means that this Board, and not your Company, shall determine as to what are sufficient subways; any other interpretation would render the Act inoperative.

"b. You claim that no system of distributing your conductors has been provided for you, by means of which you can get from the man-holes to points you desire to reach. This is absolutely false. You are referred to the statute quoted and to the notice sent you by the Board many months since, in which you will find a system of distribution provided and authorized for you whenever you might desire it; and give evidence of your intention to occupy it; and all this in the shape most desirable for your Company, inasmuch as you were invited to suggest any plan of distribution which you might think better for your purpose—to all of which you have paid no attention.

"c. You object to the subways as constructed on the ground that you cannot do your business in them, on account of electrical difficulties, and have been trying to create the impression that no solution of operating electrical conductors underground has as yet proved successful. As to this, you are informed of what you already well know, that many miles of electric light conductors are being operated in subways similar to those provided for you in New York, though possibly not as well constructed.

"d. You object to the placing of your wires in the subways provided, on the ground that you cannot furnish your customers with light as cheaply as you are now doing. As to this, you are informed that the question of expense to your customers for lights is not to be considered in the same moment as the question of safety to the lives and property and citizens and obedience to the law of the State. You will not be allowed longer to operate your conductors in the shiftless, reckless manner heretofore adopted by you, as evidenced by the numerous reports of dangerous places in your lines made by inspectors day by day; and, if you were right in your assumption that your business cannot be done according to the directions given you by this Board, then you must distinctly understand you will not be allowed to do business at all in the City of New York.

"Your attention is called to the 4th section of the Act above referred to: 'And except with such permission, no electrical conductors,' etc., 'shall hereafter be continued, constructed, erected or maintained, or strung above ground in any part of said city,' etc., and you are distinctly notified that the Board of Electrical Control, under the authority and responsibility vested in it by the People of the State of New York, will no longer permit the doing of the business of arc lighting in the City of New York in the manner in which it has been done in the past.

"e. To all of your objections the same reply may be made—that they are specious, calculated to deceive, not founded on fact, impertinent to the issue, and in opposition

to and evasion of the laws of the State, which your corporation, as a creature of law, is bound to respect and obey.

"By virtue of the authority vested in the Board of Electrical Control, you are directed to cease to operate your lines of conductors upon the following streets and avenues, to wit:

Broadway, from 14th to 45th streets.
Sixth avenue, from 18th to 58th streets,

and all the streets from 23d to 28th streets running between Sixth avenue and Broadway. You are notified that you are without the permission of this Board to continue, operate and maintain conductors in these streets and avenues—that to continue, operate and maintain them, without such permission, is in direct violation of the statute above quoted—that a violation of a statute is by the Penal Code a misdemeanor, and that the Board of Electrical Control will prosecute such violations to the full extent of the law. You are further notified and directed to remove from the streets of the city above named all of your poles, fixtures, devices and electrical conductors immediately. In default of your so doing, you are notified that the Board will take action as best it can for their removal.

"In the opinion of the Board, yours is the only corporation openly and flagrantly violating and defying the law relating to electrical conductors and questioning and impugning the authority of the Board of Electrical Control; and the fact that you assert, again and again, in your communications, your desire to do what is right, makes no difference so long as your actions belie your words.

"The Brush Electric Illuminating Company, which has been your chief competitor in the business of arc lighting in the City of New York, has ordered a cable to be placed in the subway, the efficiency of which for three years is guaranteed by the manufacturers with whom the contract is made, and which, it is said, will comply with all the rules and regulations of the Board in respect to underground conductors. Other electric lighting companies manifest their eagerness to enter the subways when they shall be constructed in the localities where they do business, and are meantime obeying the rules and regulations of the Board and gradually conforming to what may be stated as the principle of 'the least possible risk to life and property' in the stringing and maintaining of arc light circuits. Under the circumstances, and within the meaning of the laws relating to electrical conductors, the Board is giving all these companies the largest possible liberty and ample opportunity and time to get into shape as seems desirable. You, and your corporation alone, defy the law, split hairs about the language of an act, the intention of which you are plainly trying to disobey, and, by misrepresentations, put off, from time to time, the consequence of your disobedience.

"It is not of the slightest consequence whether you can or cannot get somebody to guarantee a cable for you when it becomes a question as to whether you are violating a statute. It is not of the slightest consequence whether you can supply your customers with lights as cheaply as you do now when you are disobeying a law. It is not of the slightest consequence whether you like the subways which have been provided for you and consider them sufficient, nor whether your dividends will be increased by getting your wires into a safe and proper condition. These things are all outside of the question.

"You were notified on September 20th, 1887, to place your conductors in the subways provided by the Board in accordance with law, and to remove your poles and wires and other electrical conductors and devices from the surface of the streets within ninety days, and, notwithstanding the fact that more than twice ninety days have since elapsed, you have done nothing of the sort. The Board has been surfeited with your excuses and prevarication, and will now proceed to ascertain whether you and your corporation or the law of the State of New York is to govern your actions.

"Very respectfully,

"THEO. MOSS, Secretary."

Unanimously adopted.

Resolved, That the Secretary be directed to send the following communication to the Superintendent of Police:

"NEW YORK, July , 1888.

"SUPERINTENDENT MURRAY, Police Headquarters, 300 Mulberry Street, City.

"DEAR SIR: I am directed by the Board of Electrical Control to inform you that, owing to absence of evidence given by them in the matter of putting the wires under ground, the permit granted to the United States Illuminating Company's Officers, to maintain their lines along streets where subways have been constructed, to wit:

Broadway, from 14th to 45th streets,
Sixth avenue, from 18th to 58th streets, and the cross streets, from 23d to 28th
streets, from Sixth avenue to Broadway

has been revoked and said company notified to discontinue the use of the said lines, as per letter directed to be sent to the said Company, of which the enclosed is a copy.

"You are requested to resume active measures against the said Company on the said streets and to arrest all persons found repairing, renewing the said lines, placing carbons in lights along them. or in any other way assisting to maintain and continue the said lines without the permission of the Board of Electrical Control, in violation of Chapter 716 of the Laws of 1887.

"In case of such arrests, upon notification, the Board will be glad to assist in the prosecution of the offender.

"Very respectfully,

"THEO. MOSS, Secretary."

Unanimously adopted.

Resolved, That the following communication be sent to the Commissioner of Public Works:

"NEW YORK, July , 1888.

"HON. JOHN NEWTON, Commissioner of Public Works, 31 Chambers St., N. Y. City.

"DEAR SIR:—I am directed by the Board of Electrical Control to notify you that the Board has notified the United States Illuminating Company to discontinue the use of its lines of conductors on the following streets and avenues, to wit:

Broadway, from 14th to 45th streets,
Sixth avenue, from 18th to 58th streets,

and the side streets from 23d to 28th streets, crossing these avenues from Broadway to Sixth avenue.

"Inasmuch as it is a violation of statute for any company to operate electrical conductors in the City of New York without the permission of the Board of Electrical Control (see Chapter 716 of the Laws of 1887, section 3), and inasmuch as said lines of electrical conductors are being maintained without such permission, it appears to the Board of Electrical Control that the case of the said poles and wires is a proper call for your action in removing the same, through the Bureau of Incumbrances, in accordance with the spirit of the communication received by the Board from you, bearing date the 18th of June, 1888, in which you say:

"In my opinion there never was any doubt that the removal of dead wires, poles, fixtures and other devices not in use, situated in the streets of the city, were incumbrances, and included within appropriations for the removal of incumbrances under the charge of this Department.

"You are, therefore, respectfully requested to remove the poles and wires of the United States Illuminating Company in the streets and avenues above designated forthwith.

"For the Board,

"THEO. MOSS, Secretary."

Unanimously adopted.

Resolved, That the Expert of the Board be directed, through his inspectors, to ascertain immediately after the notification which is authorized to be sent to the United States Illuminating Company whether the said Company is continuing and maintaining lines of electrical conductors and report such violations—if any—to Commissioner Gibbens, who is authorized and directed, as a Committee for the Board, to take such action, in case of such violation of statute, as shall seem most likely to lead to proper punishment of the same, either by swearing out warrants for the arrest of the officers of said Company, or by laying the matter before the Grand Jury of the County, or by prosecuting employees of the Company detected in repairing and maintaining said lines without permission of the Board, or by all these methods or any of them, or such others as may seem to him to be desirable, and in this matter to exercise his discretion as to the employment of counsel and other matters in connection therewith.

Unanimously adopted.

The following communication was read:

CORONER'S OFFICE,

67 PARK ROW,

NEW YORK, June 29th, 1888.

The Board of Electrical Control.

GENTLEMEN: In view of the verdict of the Coroner's jury in the case of lineman Murray, who was killed recently by shock from an improperly insulated electric wire, and of the fact that the jury saw fit to request me as the Coroner who conducted the

inquest to call the attention of the proper authorities to the matter, in order that the dangerous wires should be placed underground, I deem it my duty to ask your honorable body what, if anything, has been done since toward protecting the public from this constant menace and danger to life.

Owing to the great importance of this question, which vitally affects the entire community, and to the growing danger from the immense and increasing number of dead wires and also wires whose insulation becomes affected from various causes. I would respectfully ask for a reply at your very earliest convenience.

Yours very truly,

FERDINAND LEVY, Coroner.

Commissioner Gibbens offered the following resolution:

Resolved, That the following letter be directed to Hon. Ferdinand Levy, Coroner, New York:

NEW YORK, July 2d, 1888.

TO HON. FERD. LEVY, Coroner, New York:

DEAR SIR:—The Board of Electrical Control has received your communication, and, in reply, I am directed to inform you that the verdict of the jury in the "Murray" case has been entered in the minutes of the Board, and every means of improving the condition of electric light wires overhead and placing them underground is being taken.

In the first place, the rules and regulations of this Board and the Board of Fire Underwriters are being enforced to some extent, and improvements in the direction of compliance with them are being insisted upon.

The Inspectors of the Board patrol the city and report violations of these regulations, and a notice is then sent to the owner of the defective service.

The report of the Expert of the Board for the first two weeks of this system of inspection shows that few if any of the companies operating conductors are doing so in a proper manner.

Violations of Rules and Regulations are reported and classed as follows:

"Report of Electrical Expert for two weeks ending Wednesday, June 27th, 1888.

"Notices sent of violations of Rules and Regulations."

Name of Company.	No. Violations, R. & R.	Dangerous Circuits.	Dead Wires.	Violation R. & R. B. F. U.	Low Lamps.	Other Violation.
U. S. Co.....	406	8	128	35	2	233
Brush Co.....	69	3	24	1	6	35
Met. T. & T. Co.....	15	..	15	..	..	..
W. U. Co.....	17	..	11	..	..	6
Harlem L. Co.....	8	3	..	..	..	3
B. & O. T. Co.....	5	..	3	..	..	2
Fuller I. Co.....	1	1	..	1	..	..
Am. R. Co.....	9	..	9	..	..	..
Gold & Stock.....	1	1	..	..	..	..
E. R. E. L. Co.....	3	..	..	2	1	..
Am'n U. T. Co.....	1	..	1	..	..	..
Total.....	535	15	194	39	9	279

Where notices to improve the condition of the wires are not attended to by the owner the Board takes further measures by requesting removal of the same by the Department of Public Works, by revoking permission to use and maintain in accordance with authority vested in the Board by Chap. 716 of the Laws of 1887, and by such other methods as are available.

The following out of this system will undoubtedly bring about a much better state of affairs and reduce the danger of operating electrical conductors to a minimum.

The reason that this system has but lately been put in operation by the Board is to be found in the lack of an appropriation for the employment of inspectors until lately, and the time required to obtain the proper persons to perform the duty.

Had electrical companies followed proper methods in stringing wires and maintaining them there never would have been such an insistance on their being put underground, for it may truly be said that were they put underground in as bad a manner as they are now put overhead, they would not only be unserviceable, but equally dangerous.

A philosophical and lucid statement of the subject is to be found in a letter lately addressed to the Board by Carpenter Smith, a noted electrical expert, who says:

"I have been running electric lights, both arc and incandescent, for the past seven years, and have never known of a case where it was conclusively proved that a man was killed by the electrical current without there having been gross carelessness in some direction. Mr. Brown could very easily account for every death that has occurred in New York (as far as I have been able to follow them) by the condition of the wires alone. Any man who would undertake to run belts carrying thousands of horse power, even in a factory, where none but skilled help are employed, in the unprotected way in which wires are run overhead in New York City, would be universally condemned. I never walk the streets of New York but my blood boils to see the criminally dangerous and reckless manner in which wires are strung through the streets. They are placed, not on poles, but mere stumps, and wood exposed to the weather seems to be considered a good enough insulator. The so-called Underwriters' covering seems to have been originally the standard, and even that is worn off in many places for several feet along the wires, while the whole air is full of dead and rotten telegraph, telephone, burglar alarm and district call wires, any one of which by falling across an Arc Light circuit, becomes itself as dangerous. It is absurdity for Mr. Brown to talk about lighting stations and 'simple rules and precautions' to be enforced therein. No precautions at the station, however valuable they may be in themselves, can render electric light safe, when the outside circuits are in this condition.

"It is this outrageous and inexcusable carelessness which has led to the cry for 'underground wires,' a cry which has so much real foundation that we may well excuse the often rabid insistance of its utterers. The fact that the wires are in this condition in the largest city in the country is taken as proof that they are in a similar condition in every city and cannot be made safe, and paper after paper reiterates the senseless shriek against the horrible danger of overhead conductors, without any reference to the manner in which they may be installed.

"An overhead wire with properly soldered joints and water-proof insulation, with insulated tie wires, and kept clear from all ground contacts on buildings or trees, and out of reach from the ground, is as safe as any underground conductor that can be

made, except in case of damage caused by fire, storms or external violence, in which cases the underground conductor has such an overwhelming advantage that this plea alone should be sufficient to cause them to go underground.

"I am an earnest advocate of underground wires and an interested one; but the claim that wires are dangerous simply because they are overhead will only hurt the cause, for that reduces it to the level of the outcry against the introduction of railroads, or gas, or any new improvement. There are enough fair arguments against overhead wires without resorting to claptrap or trickery.

"If Mr. Brown kept himself posted, as any one who wishes to pose as a general Electrical Teacher should certainly do, he might have noticed a report in one of the Electrical papers of a painter who fell from the roof of a building in Pittsburgh, and who saved his life by catching hold of the two opposite leads of an overhead circuit carrying one thousand volts of alternating current, by which he hung until taken down unhurt with a ladder. This is what I call good practice in overhead construction. High insulation and such solid work that your wires can stand the strain of a man falling twenty feet onto them, without tearing them loose."

This expresses some of the findings of your intelligent jury, as well as certain of the conclusions of the Board of Electrical Control.

As regards the placing of the electrical conductors in subways provided, the Board may briefly summarize its success as follows:

The subways completed up to the present time are:

For Telegraph and Telephone service, 1,259,465 feet of single duct, estimated as capable of containing 100 times as many feet of electrical conductors, and now containing 4,000 miles in present use, or about to be used shortly.

For Incandescent Lighting Service, 210,366 feet of single duct, containing 3 times as many miles of electrical conductors now in use, or about to be used.

For Arc Lighting and Power Service, 303,283 feet of single duct, capable of containing 8 times as many feet of electrical conductors, none of which is now in use, but about which the Board is concerned and earnest in its endeavor to fill with wires.

The subways extend along the following streets and avenues:

For Telegraph and Telephone Conductors:

Sixth avenue, from 9th to 59th streets.
 Broadway, from 15th to 44th streets.
 Madison avenue, from 23d to 40th streets.
 Broadway, from Pearl to Vesey street.
 Park Row, from Ann to New Chambers streets.
 Broad street, from South William street to Exchange Place.
 Exchange Place, from Broad to New Church streets.
 Barclay street, from New Church street to College Place.
 Church street, from Exchange Place to Barclay street.
 College Place, West Broadway and South Fifth avenue to Spring street.
 Spring street, from Broadway to South Fifth avenue.
 Greene street, from Spring to Houston streets.
 Cortlandt street, from Broadway to Church street.
 18th street, from Broadway to Sixth avenue.

32d street, from Broadway to Fifth avenue.
38th street, from Fourth avenue to Broadway.
42d street, from Fifth avenue to Broadway.
45th street, from Vanderbilt Place to Sixth avenue.

For Arc Light and Power Conductors:

Broadway, from 14th to 45th streets.
19th street, from Sixth to Fifth avenues.
23d street, from Sixth to Fourth avenues.
24th street, from Sixth avenue to Broadway.
25th street, from Sixth avenue to Broadway.
26th street, from Sixth avenue to Broadway.
27th street, from Sixth avenue to Broadway.
28th street, from Sixth avenue to Broadway.
42d street, from Sixth avenue to Broadway.
Sixth avenue, from 18th to 50th streets.

For Edison Incandescent Lighting Conductors:

18th street, from Broadway to Sixth avenue.
19th street, from Broadway to Sixth avenue.
20th street, from Broadway to Fifth avenue.
21st street, from Broadway to Sixth avenue.
23d street, from Fourth to Sixth avenue.
24th street, from Broadway to Sixth avenue.
26th street, from Sixth to Fifth avenues.
27th street, from Fifth to Sixth avenues.
28th street, from Fifth to Sixth avenues.
29th street, from Fifth to Sixth avenues.
30th street, from Fifth to Sixth avenues.
31st street, from Fifth to Sixth avenues.
32d street, from Fifth to Sixth avenues.
33d street, from Fifth avenue to Broadway.
34th street, from Fifth to Sixth avenues.
35th street, from Fifth to Sixth avenues.
36th street, from Third to Sixth avenues.
37th street, from Fourth to Sixth avenues.
38th street, from Fourth to Sixth avenues.
39th street, from Fifth avenue to Broadway.
40th street, from Fifth avenue to Broadway.
42d street, from Fifth avenue to Broadway.
Madison avenue, from 36th to 38th streets.
Fourth avenue, from 36th to 38th streets.
Broadway, from 14th to 45th streets.
Sixth avenue, from 18th to 50th streets.

The companies operating Arc Light Circuits on these streets and avenues are:

The Brush Electric Illuminating Company.
The United States Illuminating Company.

On the 20th day of September, 1887, at a regular meeting of the Board, in accordance with Chapter 716 of the Laws of 1887, the following resolution was passed:

Whereas, In the opinion of this Board, a sufficient construction of conduits or subways under ground has been made ready, reference being had to the general direction and vicinity of the electrical conductors in use overhead in the following streets and localities of the city, to wit: Broadway, from Thirty-fourth to Fourteenth streets, Twenty-third, Twenty-fourth, Twenty-fifth, Twenty-sixth, Twenty-seventh and Twenty-eighth streets, from Fifth to Sixth avenue. Nineteenth and Twenty-first streets, from Broadway to Sixth avenue; therefore be it

Resolved, That the Secretary be directed to notify the owners or operators of the electrical conductors above ground in said streets or localities to make such electrical connections in said streets with such underground conduits or subways as may be necessary to the proper transaction of their business in the said conduits, and to remove poles, wires or other electrical conductors above ground and their supporting fixtures or other devices from the said streets and localities within ninety days after the receipt of this notice. And said companies are further notified to submit plans of said electrical connections hereby authorized, together with modifications of or additions to said conduits necessary, or deemed so to be, for making the same, to this Board, within ten days, or as soon thereafter as possible, so that this Board may cause the said modifications or additions to be made, if they appear to be proper and necessary; and, in case the said suggestions for the modification of or additions to said conduits are not submitted to the Board, or do not appear to the Board to be proper and necessary, the following methods are designated by the Board for the making of the said electrical connections in the said streets: For electric light and power conductors, subsidiary iron tubes from the nearest manhole in said subway to the point desired to be reached, and through said iron tubes insulated wires or cables connecting the lights, machinery or termini of overhead lines with electrical conductors in the said conduits. For other service, subsidiary pipes or boxes, either of wood or iron, extending from the nearest manhole to the point desired to be reached, with insulated conductors connecting the instruments or termini of overhead routes with the wires in the said conduits. The Consolidated Telegraph and Electrical Subway Company is authorized and directed to construct said subsidiary ducts or boxes at such places as shall be desired by companies notified to use the subways as above upon the application of such companies;

And in accordance therewith, notices were served on the said companies.

After the expiration of ninety days, also, as directed by statute, the following resolution was passed:

Resolved, That the Mayor be requested to order the removal by the Commissioner of Public Works, through the Bureau of Incumbrances, of the following wires, poles and other fixtures, the ninety days' notice required by law having expired without their being removed by the owners or operators thereof, to wit:

1. All the wires of the Metropolitan Telephone and Telegraph Company on poles on Sixth avenue, from 22d to 32d street, in number from fifteen to thirty-eight.
2. All the poles of the Metropolitan Telephone and Telegraph Company, or lately used by the said Company, on Sixth avenue, from 22d to 32d streets, being in number twenty (except such as may be required pending the placing under ground of the wires of the Fire and Police Departments).
3. All the poles and wires of the United States Illuminating Company, on the north side of 25th street, between Sixth avenue and Broadway, being about 11 wires and 5 poles, the poles on corner of Broadway and Sixth avenue excepted.

Subsequently thereto the following resolution was adopted:

Resolved, That the Mayor be requested to order the removal by the Commissioner of Public Works, through the Bureau of Incumbrances, of the following wires, poles and other fixtures, the ninety days' notice required by law having expired without their being removed by the owners or operators thereof, to wit:

Broadway, from 14th to 45th streets,
19th street, from Sixth to Fifth avenues,
23d street, from Sixth to Fourth avenues,
24th street, from Sixth avenue to Broadway,
25th street, from Sixth avenue to Broadway,
26th street, from Sixth avenue to Broadway,
27th street, from Sixth avenue to Broadway,
28th street, from Sixth avenue to Broadway,
42d street, from Sixth avenue to Broadway,
Sixth avenue, from 18th to 50th streets.

But as you are aware, and for reasons stated, the requests of the Board were not complied with by the Mayor of New York.

After repeated requests to the Mayor in the same line, the Board was compelled to take other measures to ensure the carrying out the law, which, though less direct, will, perhaps, prove as efficient.

Arrests of linemen of the Companies while repairing and trimming lights were followed by requests from said Companies for permits to keep their lines in repair conditionally on their taking active steps towards placing their conductors underground; and the following permits were granted:

No, 1186.

Permit of the Board of Electrical Control.

To the Brush Electric Illuminating Company:

You are hereby authorized to renew and repair, and to keep in repair, according to the rules and regulations of the Board, the lines of your Company along the streets where they have been ordered underground for three weeks, and at the end of that time, upon the presentation of substantial evidence of good faith in carrying out the agreement to place your conductors in the subways, this permit can be renewed for such a time as may be necessary.

THEO. MOSS, Secretary.

Granted by resolution of the Board, June 11th, 1888.

No. 1273.

At a meeting of the Board of Electrical Control, held June 15th, 1888, the following resolution was adopted:

Resolved, That a permit be granted to the Superintendent of the United States Illuminating Company to repair and maintain the lines of said Company on streets and avenues where subways have been provided, for two weeks from to-day, inasmuch as

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said Company has agreed to go into the subways as soon as possible. The understanding being that said Company will comply with all the rules and regulations of the Board and will offer substantial evidence of its good faith as to going underground before the expiration of the period designated, in which case the permit may be extended.

THEO. MOSS, Secretary.

Dated June 15th, 1888.

The Board is of the opinion that the Brush Company, inasmuch as it has ordered a cable, is in earnest, but that the United States Company, as evidenced by the following letters received by the Board, cannot be depended on:

THE UNITED STATES ILLUMINATING CO.,

59 AND 61 LIBERTY ST.,

NEW YORK, June 19, 1888.

THEODORE MOSS, Esq., Secretary Board of Electrical Control,
1218 Broadway, New York:

DEAR SIR:—We are in receipt of your communication of the 15th inst. containing a copy of a resolution of the Board of Electrical Control, adopted on that day.

We would respectfully reply, that we are endeavoring to get some cable which will enable us to make an actual trial at the present subway ducts; but although we have obtained a number of specimens, we have been unable so far to get any cable manufacturer to give us any satisfactory guarantee as to cable intended to be used in such subway.

We are entirely willing, just as soon as we can arrange to get proper cable, to make use of the present subway to ascertain whether the objections raised against its use as a duct for a street cable are insurmountable, but of course by doing this we do not waive our position taken in respect to the subways as a sufficient system of subways within the meaning of the law, and we trust that you will accept this as sufficient evidence of our good faith to grant us the permit we desire in the meantime for repairs, etc.

Your resolution goes too far in its recitals that we have agreed to go into the subways as at present constructed, and have had an understanding with your Board as recited.

We enclose a copy of a letter dated May 31, 1888, addressed to the Company by the Corporation Counsel of this City, and of our reply thereto, dated June 5th, 1888. That reply correctly states our position.

Very respectfully yours,

EUGENE T. LYNCH, President.

NEW YORK, May 31, 1888.

EUGENE T. LYNCH, Esq., President United States Illuminating Company:

DEAR SIR:—I have been instructed by the Mayor to cause proceedings to be instituted requiring your Company to enter subways and to remove your poles and wires

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from the streets. Before causing the necessary proceedings to be taken, I desire to be advised by you whether your refusal so far to do this, arises from any objection to the sufficiency of the subways which have been provided, and if so, generally what your objections may be, and whether any attempt on the part of the Commissioner of Public Works, under proper authority to do so, to remove any of your poles and wires under the provisions of Chapter 716 of the Laws of 1887, is likely to be resisted by your Company.

Yours respectfully,

HENRY R. BEEKMAN, Counsel to the Corporation.

THE UNITED STATES ILLUMINATING COMPANY,

59 AND 61 LIBERTY STREET.

HON. HENRY R. BEEKMAN, Counsel to the Corporation:

DEAR SIR:—In reply to your communication of the 31st of May, informing me that you have been instructed by the Mayor to commence proceedings requiring the United States Illuminating Company, of which I am President, to enter subways and to remove poles and wires from the streets, and asking to be advised as to the ground of our objection, I beg to refer you to the correspondence already had between our Company and the Board of Electrical Control on this subject, in which, and in our oral discussions with the Board and Engineer Beckwith, we have insisted and now insist that no sufficient subways have been constructed in the streets for the purpose required, and that no provision has been made for local connection of wires, and distribution of wires and lights along the blocks and on the opposite side of the streets through which the main subways are laid, rendering it impossible for us to make any use of the subway as constructed. We also have to say, that in other respects the provisions of Chapter 716 of the Laws of 1887 have not been complied with by the Board of Electrical Control, especially in view of the provisions of the previous statutes and laws referred to in that act.

In answer to your further question, whether any attempt on the part of the Commissioner of Public Works to remove our poles and wires is likely to be resisted by the Company, I would say, that we shall expect to maintain our property rights to such extent as the law affords protection in their exercise.

Very respectfully yours,

EUGENE T. LYNCH, President.

In consequence of these letters the Board has passed the following resolutions, which explain themselves:

Resolved, That the Secretary be directed to send to the President of the United States Illuminating Company the following letter:

NEW YORK, July , 1888.

EUGENE T. LYNCH, ESQ., Pres. U. S. Illuminating Company,
59 Liberty Street, City:

DEAR SIR:—Your letters defining the position of your Company have been received and read at a meeting of the Board held on the day of July, 1888. In reply, I am directed to state for the Board.

First.—The Board is surprised at the evident lack of good faith shown by your Company in its relations with the Board, inasmuch as you have secured through the representations of your Superintendent and made use of a permit granted expressly and bearing on its face an evidence that it was granted expressly with the understanding that you were about to conform to the requests of the Board and place your wires in the subways which have been constructed according to the Acts relating to electrical conductors in the City of New York, and have since, by your letters referred to, negatived the representations made as above, and now plainly show your intention to avail yourself of every possible pretext for disobedience to the will of the People, by whose favor your corporation came into existence and now lives.

Second.—The objections which you raise to occupancy of the subways and the removal of your conductors from the surface of the streets are illogical, untenable, inadequate, and will prove futile. They may be summed up and answered briefly:

a. You complain that no general system of subways has been adopted by the Board in conformity with law. You are referred to Section 3 of Chap. 716 of the Laws of New York—"Whenever, in the opinion of the Board hereinbefore constituted, in any street or locality of said city a sufficient construction of conduits or subways underground shall be made ready under the provisions of this act, reference being had to the general direction and vicinity of the electrical conductors then in use overhead," etc.—which means that this Board, and not your Company nor any other corporation, shall determine when you shall go underground; which means that this Board, and not your Company, shall determine as to what are sufficient subways; any other interpretation would render the Act inoperative.

b. You claim that no system of distributing your conductors has been provided for you, by means of which you can get from the man-holes to points you desire to reach. This is absolutely false. You are referred to the statute quoted and to the notice sent you by the Board many months since, in which you will find a system of distribution provided and authorized for you wherever you might desire it and give evidence of your intention to occupy it; and all this in the shape most desirable for your Company, inasmuch as you were invited to suggest any other plan of distribution which you might think better for your purpose—to all of which you have paid no attention.

c. You object to the subways as constructed on the ground that you cannot do your business in them, on account of electrical difficulties, and have been trying to create the impression that no solution of operating electrical conductors underground has as yet proved successful. As to this, you are informed of what you already well know, that many miles of electric light conductors are being operated in subways similar to those provided for you in New York, though possibly not as well constructed.

d. You object to the placing of your wires in the subways provided, on the ground that you cannot furnish your customers with lights as cheaply as you are now doing. As to this, you are informed that the question of expense to your customers for lights is not to be considered in the same moment as the question of safety to the lives and property of citizens and obedience to the law of the State. You will not be allowed longer to operate your conductors in the shiftless, reckless manner heretofore adopted by you, as evidenced by the numerous reports of dangerous places in your lines made by our inspectors day by day; and, if you were quite right in your assumption that your business cannot be done according to the directions given you by this Board, then you must distinctly understand you will not be allowed to do business at all in the City of New York.

Your attention is called to the 4th section of the Act above referred to: "And except with such permission, no electrical conductors," etc., "shall hereafter be continued, constructed, erected or maintained, or strung above ground in any part of said city," etc., and you are distinctly notified that the Board of Electrical Control, under the authority and responsibility vested in it by the People of the State of New York, will no longer permit the doing of the business of arc lighting in the City of New York in the manner in which it has been done in the past.

e. To all of your other objections the same reply may be made—that they are specious, calculated to deceive, not founded on fact, impertinent to the issue, and in opposition to and evasion of the laws of the State, which your corporation, as a creature of law, is bound to respect and obey.

By virtue of the authority vested in the Board of Electrical Control, you are directed to cease to operate your lines of conductors upon the following streets and avenues, to wit:

Broadway, from 14th to 45th streets.
Sixth avenue, from 18th to 58th streets.

And all the streets from 23d to 28th streets running between Sixth avenue and Broadway. You are notified that you are without the permission of this Board to continue, operate and maintain conductors in these streets and avenues—that to continue, operate and maintain them, without such permission, is in direct violation of the statute above quoted—that the violation of a statute is by the Penal Code a misdemeanor, and that the Board of Electrical Control will prosecute such violations to the full extent of the law. You are further notified and directed to remove from the streets of the city above named all of your poles, fixtures, devices and electrical conductors immediately. In default of your so doing, you are notified that the Board will take action as best it can for their removal.

In the opinion of the Board, yours is the only corporation openly and flagrantly violating and defying the law relating to electrical conductors and questioning and impugning the authority of the Board of Electrical Control; and the fact that you assert, again and again, in your communications, your desire to do what is right, makes no difference so long as your actions belie your words.

The Brush Electric Illuminating Company, which has been your chief competitor in the business of arc lighting in the City of New York, has ordered a cable to be placed in the subway, the efficiency of which for three years is guaranteed by the manufacturers with whom the contract is made, and which, it is said, will comply with all the rules and regulations of the Board in respect to underground conductors. Other electric lighting companies manifest their eagerness to enter the subways when they shall be constructed in the localities where they do business, and are meantime obeying the rules and regulations of the Board and gradually conforming to what may be stated as the principle of "the least possible risk to life and property" in the stringing and maintaining of arc light circuits. Under the circumstances, and within the meaning of the laws relating to electrical conductors, the Board is giving all these companies the largest possible liberty and ample opportunity and time to get into such shape as seems desirable. You, and your corporation alone, defy the law, split hairs about the language of an act, the intention of which you are plainly trying to disobey, and, by misrepresentations, put off, from time to time, the consequence of your disobedience.

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It is not of the slightest consequence whether you can or cannot get somebody to guarantee a cable for you when it becomes a question as to whether you are violating a statute. It is not of the slightest consequence whether you can supply your customers with lights as cheaply as you do now when you are disobeying a law. It is not of the slightest consequence whether you like the subways which have been provided for you and consider them sufficient, nor whether your dividends will be increased by getting your wires into a safe and proper condition. These things are all outside of the question.

You were notified on September 20th, 1887, to place your conductors in the subways provided by the Board in accordance with law, and to remove your poles and wires and other electrical conductors and devices from the surface of the streets within ninety days, and, notwithstanding the fact that more than twice ninety days have since elapsed, you have done nothing of the sort. The Board has been surfeited with your excuses and prevarication, and will now proceed to ascertain whether you and your corporation or the law of the State of New York is to govern your actions.

Very respectfully,

THEODORE MOSS, Secretary.

Resolved, That the Secretary be directed to send the following communication to the Superintendent of Police:

NEW YORK, July , 1888.

SUPERINTENDENT MURRAY, Police Headquarters, 300 Mulberry street, City:

DEAR SIR:—I am directed by the Board of Electrical Control to inform you that, owing to the absence of evidence given by them in the matter of putting the wires under ground, the permit granted to the United States Illuminating Company's officers, to maintain their lines along streets where subways have been constructed, to wit:

Broadway, from 14th to 45th streets,

Sixth avenue, from 18th to 58th streets, and the cross streets, from 23d to 28th streets, from Sixth avenue to Broadway,

has been revoked and said Company notified to discontinue the use of the said lines, as per letter directed to be sent to the said Company, of which the enclosed is a copy.

You are requested to resume active measures against the said Company on the said streets and to arrest all persons found repairing, renewing the said lines, placing carbons in lights along them, or in any other way assisting to maintain and continue the said lines without the permission of the Board of Electrical Control, in violation of Chapter 716 of the Laws of 1887.

In case of such arrests, upon notification, the Board will be glad to assist in the prosecution of the offender.

Very respectfully,

THEO. MOSS, Secretary.

Resolved, That the following communication be sent to the Commissioner of Public Works:

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NEW YORK, July , 1888.

HON. JOHN NEWTON, Commissioner of Public Works,
31 Chambers street, N. Y. City:

DEAR SIR:—I am directed by the Board of Electrical Control to notify you that the Board has notified the United States Illuminating Company to discontinue the use of its lines of conductors on the following streets and avenues, to wit:

Broadway, from 14th to 45th streets,
Sixth avenue, from 18th to 58th streets,

and the side streets from 23d to 28th streets, crossing these avenues from Broadway to Sixth avenue.

Inasmuch as it is a violation of statute for any company to operate electrical conductors in the City of New York without the permission of the Board of Electrical Control (see Chapter 716 of the Laws of 1887, Section 3), and inasmuch as said lines of electrical conductors are being maintained without such permission, it appears to the Board of Electrical Control that the case of the said poles and wires is a proper case for your action in removing the same, through the Bureau of Incumbrances, in accordance with the spirit of the communication received by the Board from you, bearing date the 18th of June, 1888, in which you say:

In my opinion there never was any doubt that the removal of dead wires, poles, fixtures and other devices not in use, situated in the streets of the city, were incumbrances, and included within appropriations for the removal of incumbrances under the charge of this Department.

You are, therefore, respectfully requested to remove the poles and wires of the United States Illuminating Company in the streets and avenues above designated forthwith.

For the Board,

THEO. MOSS, Secretary.

Resolved, That the Expert of the Board be directed, through his inspectors, to ascertain immediately after the notification which is authorized to be sent to the United States Illuminating Company whether the said Company is continuing and maintaining lines of electrical conductors and to report such violations—if any—to Commissioner Gibbens, who is authorized and directed, as a Committee for the Board, to take such action, in case of such violation of statute, as shall seem most likely to lead to proper punishment of the same, either by swearing out warrants for the arrest of the officers of said Company, or by laying the matter before the Grand Jury of the County, or by prosecuting employees of the Company detected in repairing and maintaining said lines without permission of the Board, or by all these methods or any of them, or such others as may seem to him to be desirable, and in this matter to exercise his discretion as to the employment of counsel and other matters in connection therewith.

In addition to this work the Board is engaged in building subways as rapidly as possible in other parts of the City and in inspecting and improving those already built, wherever it is found such improvement can be made.

In reference to taking down poles and wires, I may say that as a result of the work of the Board the following were removed last year:

On east side of Third avenue, between 46th and 110th streets.....	127	poles.
On east side of Ninth avenue, between 17th and 50th streets.....	75	"
On 55th street, between Second avenue and East River.....	15	"

	217	poles.
On east side of Third avenue, from 46th to 110th streets.....	17	wires.
On Avenue A and First avenue, from 5th to 55th streets.....	12	"
On 55th street, from 10th avenue to North River.....	47	"
On 11th avenue, from 15th to 55th streets.....	16	"
On Sixth avenue, from 20th to 58th streets.....	155	"

The following are now being removed, or will shortly be removed:

On 58th street, from Sixth to Third avenues.....	60	poles.
On First avenue, from 58th to 106th streets.....	200	"
On Third avenue, from 58th street to Brooklyn Bridge.....	200	"
On Sixth avenue, from 18th to 58th streets.....	320	"

With the wires attached thereto.

The Board has reason to believe that its work will result, before the end of the present summer, in substantially clearing the following streets and avenues:

Park Row.
Sixth avenue,
Madison avenue,
Broadway, from 14th to 59th streets,
Thirty-eighth street,
Fifty-eighth street,
Forty-second street,
Twenty-third street,
Eighteenth street,

and parts of 19th, 21st, 22d, 24th, 25th, 26th, 27th, 28th, 29th, 32d, 45th, Spring street, Barclay street, Exchange Place, Church street, College Place, and some other streets in the lower part of the city.

Trusting that this explanation as showing the earnest and active effort of the Board to accomplish the results indicated as desirable in the verdict of your jury in the "Murray" case will be satisfactory, I am

With great respect,

THEO. MOSS, Secretary for the Board.

Unanimously adopted.

Mr. Lauterbach, President of the Consolidated Telegraph and Electrical Subway Company, appeared before the Board and stated that his Company had obtained control of most of the distributing systems and had been experimenting with many of them. He asked the Board to approve the Johnstone Distributing System for the use of Arc Light conductors in the district already covered with conduits of this character.

President Hess offered the following resolution :

Resolved, That the matter of the statement and request made by Mr. Lauterbach be referred to the Electrical Expert and the Engineer of the Board, and that they report thereon at the next meeting.

Unanimously adopted.

The following communication was read and ordered to be spread on the minutes :

JUNE 29, 1888.

H. S. KEARNY, ESQ., Engineer of the Board of Electrical Board,
1218 Broadway, City :

DEAR SIR:—We will furnish an electric light cable to go in the ducts here in New York and guarantee it to carry a current of fifteen hundred (1500) volts. Of course, we will not guarantee it against rough treatment or mechanical injury.

Yours truly,

WESTERN ELECTRIC COMPANY,

J. M. JACKSON, Treasurer.

Commissioner Gibbens stated that Mr. J. Reddington asks permission to erect a lamp post and place a lamp thereon at northwest corner of 42d street and Broadway, and he moved the following resolution :

Resolved, That permission be granted to J. Reddington to erect a lamp post in front of his premises at the northwest corner of 42d street and Broadway, subject to the rules and regulations, and the Secretary be directed to make out a permit for him in the form of a resolution with the ordinary and regular restrictions.

Unanimously adopted.

The following communications were read and ordered to be spread on the minutes :

EXECUTIVE OFFICES OF

THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.,

18 CORTLANDT STREET,

NEW YORK, June 29th, 1888.

The Honorable Board of Electrical Control, 1218 Broadway, New York City :

GENTLEMEN:—Referring to my letters of April 16th and May 9th, last, in which statements were submitted showing the work performed by this Company in its endeavor to carry out the law for the removal of its poles and wires from the streets of New York, I herewith beg to submit for your further information, what has been done toward that end since my last communication.

The total amount of cables drawn in since the report of April 16th is as follows :

CABLES DOWN BROADWAY.

Wire mileage.....	163,500
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CABLES UP BROADWAY.

Wire mileage.....	151,650
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CABLES, 58TH STREET, EAST.

Wire mileage.....	170,000
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CABLES, 58TH STREET, WEST.

Wire mileage.....	35,300
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Total	520,450
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Previously reported (May 9th)*.....	2,688,000
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Or a grand total of.....	3,208,450
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All the above cables have been actually laid and nearly all spliced.

The 58th street cables, from Sixth to Third avenues, will be ready for use probably not later than July 15th, and arrangements have been made to remove all our wires from 58th street at once.

During the past two weeks we have in our downtown district, between Exchange Place and Beaver street, on Broadway, cleared up and removed from housetops some sixty-three miles (10,000 lbs.) of wire, besides a small amount of aerial cables.

Rapid progress in our downtown district in the way of securing proper terminal facilities is being made. Arrangements have been made at a large expense to this Company, not only in securing these privileges, but in connecting with the subsidiary ducts and thence in and through various buildings.

Among the buildings secured for terminal facilities are: 32 Broadway, Washington Building, N. Y. Produce Exchange, S. E. corner of Exchange Place and Broadway; besides others secured or to be secured.

In connection with these, a system of service boxes is being arranged for at the following and other points:

10 Broadway, 18 Broadway and 28 Broadway.

The fire of May 23d at our 39th Street Exchange, following so closely on the heels of the storm of March 12th, and from which we had barely recovered, impeded our progress considerably; all of our experienced men having been called upon to work night and day to restore service to our uptown subscribers and to repair the large amount of damage done to our electrical plant, principally by water. Fully three weeks' time was thus consumed of our best and most experienced men. In addition to

*This included the wire mileage in the Edison and Brooks underground systems.

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this the unusually heavy rains of May last, to some considerable extent, interrupted the splicing of our cables, it being found impossible in very wet weather for the men to make proper splices in the manholes.

From the above statement and report furnished it is evident that the work of placing our wires underground is being pushed as rapidly as possible.

Trusting that the above report meets with your approval,

I am, respectfully,

W. H. ECKERT, General Manager.

NEW YORK, June 18th, 1888.

HON. THEODORE MOSS, Commissioner and Secretary Board of Electrical Control:

DEAR SIR:—Your communication of the 12th instant was received during my absence from the City.

In my opinion there never was any doubt that the removal of dead wires, poles, fixtures, and other devices not in use, situated in the streets of the City, were incumbrances, and included within appropriations for the removal of incumbrances under the charge of this Department.

I beg leave also to say, that this Department will encounter great difficulties in ascertaining the existence of these dead wires, poles, fixtures, etc., without specific reports from your Board giving their exact location and extent.

I reciprocate your wished-for co-operation in this matter, and can perceive no obstacle in the way so far as dead wires and other devices not in use are concerned, except, perhaps, in extreme cases where dead wires may be stretched upon the same poles with wires still in use.

Very respectfully,

JOHN NEWTON, Commissioner of Public Works.

The following application was read:

NEW YORK, June 28th, 1888.

HON. THEODORE MOSS, Secretary:

DEAR SIR:—We respectfully make application herewith for a permit from your Board for permission to erect carrying poles and string conductors on streets and avenues where we have obtained commercial lighting.

We make this application with confidence, because, first, such permits have been heretofore and recently granted by your Board; secondly, should it be required as a further assurance of our desire to obey the law under which you are acting, we are willing to execute and deliver to you a bond guaranteeing faithful observance of and honest compliance with the rules established by you.

Awaiting your early answer to this application, we are,

Respectfully yours,

HARLEM LIGHTING CO.

Commissioner Hess moved the following resolution:

Resolved, That the application of the Harlem Lighting Company be referred to the Engineer and the Electrical Expert of the Board.

Commissioner Gibbens moved the following as an amendment to the resolution offered by Commissioner Hess:

Resolved, That the resolutions adopted at the last meeting granting permits to the Mount Morris Electric Light Company and the Brush Electric Illuminating Company be reconsidered and the permits and the applications for permits in the cases of these companies and the application of the Harlem Lighting Company be laid on the table.

Lost. Vote: Commissioner Gibbens "aye"; Commissioners Hess and Moss "no."

Resolution of Commissioner Hess adopted; Commissioners Hess and Moss voting "aye"; Commissioner Gibbens declined to vote.

Commissioner Gibbens raised the point of order that as three Commissioners were present and only two voted, the resolution was not passed.

President Hess overruled the point of order.

The following communication was read:

OFFICE OF CIVIL SERVICE COMMISSION,

ALBANY, June 8th, 1888.

THEODORE MOSS, ESQ., Secretary Board of Electrical Control, New York City:

DEAR SIR:—I have the honor to acknowledge the receipt of your communications of the 15th and 16th June inst., notifying this Commission of the appointments of Messrs. S. S. Wheeler, Robert J. Reilly and George W. Roth from the eligible lists for employees under your Board.

Should the Board desire to make further appointments there are still on the lists two Electrical Experts, two Inspectors of Underground Construction and nine Inspectors of Electrical Conductors.

Very respectfully yours,

CLARENCE D. ANGLE, Secretary.

Commissioner Gibbens moved the following resolution:

Resolved, That the communication from the Secretary of the Civil Service Commission be laid on the table.

Unanimously adopted.

Commissioner Gibbens stated that the Board had before it an application of the United States Illuminating Company, dated July 2d, 1888, to be allowed an extension of the permit granted to this Company on June 15th, 1888, to repair their lines on

streets where subways have been laid, and in view of the fact that this subject had been touched upon and passed upon by the Board he would ask that the application be laid on the table. President Hess—there being no objection—so directed.

Commissioner Gibbens also stated that the Board had before it two other applications of the United States Company, dated July 2d, 1888, to erect new support poles in localities therein specified, and as the Company was in contempt asked to have these also laid on the table. President Hess—there being no objection—so ordered.

The following communications were read:

THE UNITED STATES ILLUMINATING CO.,

59 AND 61 LIBERTY STREET,

NEW YORK, June 27th, 1888.

Board of Electrical Control:

GENTLEMEN:—Yours of the 21st inst. received. (Book 3, Page 16.) Five reported dead wires on pole southeast corner of Broadway and Bond street. In circuit.

Respectfully yours,

E. LYNCH, President.

THE UNITED STATES ILLUMINATING CO.,

59 AND 61 LIBERTY STREET,

NEW YORK, June 27th, 1888.

Board of Electrical Control:

GENTLEMEN:—Yours of 21st inst. received, (Book I, Page 12), as to dead poles and wires at Greenwich street and Battery Place, and West street, said wires being cut into city circuit.

Respectfully yours,

E. LYNCH, President.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to inform the President of the United States Illuminating Company that to cut dead wires into circuit is not in accordance with the rules and regulations of the Board and such action in violation of the rules and regulations will be prosecuted to the full extent of the law.

Unanimously adopted.

Schuyler S. Wheeler, Electrical Expert of the Board, read the following Report. which was ordered to be spread on the minutes:

NEW YORK, July 2d, 1888.

Report of Electrical Expert for two and one-half weeks, ending July 2d, 1888:

During the eighteen days since this Department was organized notices have been sent out calling attention to violations of the rules and regulations of the Board. Of these, fifteen were cases of electric light circuits which were positively dangerous to life and property.

The form of notice adopted states definitely the location of the objectionable wire and the nature of the trouble, and informs the owners that they are required to make the necessary alterations at once.

In reply to these notices about one hundred cases of violations have been attended to by the owners of the faulty wires; but the cases selected for action are those most easily remedied, as, for instance, in taping bare spots on wires; and in no case has any radical action been taken by any of the companies.

In about twenty cases the statements of the inspectors have been denied by the owners of the wires, but after verification by another inspector a second notice has been served upon the owner in each case.

Ten cases of dead wires, poles, etc., have been referred to the Bureau of Incumbrances of the Department of Public Works after an effort to find the owner. In several instances the owner has denied property to avoid expense of removal.

The following are the cases referred to the Bureau of Incumbrances to date:

Heavy cable, two inches in diameter, extending over housetops and poles from 63 Broadway to Canal street.

Very old dead pole in Nassau street, near Wall.

Row of poles in 41st street, extending from Broadway to 8th avenue.

Four dead circuits on Broadway from 14th to 30th streets, on poles of the United States Illuminating Company, among their live wires.

Dead electric light wire crossing under Elevated Road at 123 Bowery.

Respectfully,

SCHUYLER S. WHEELER, Electrical Expert.

The following communication was read:

NEW YORK, July 2d, 1888.

The Board of Electrical Control:

GENTLEMEN:—I desire to call attention to the fact that most of the streets of the city are unnecessarily disfigured and made dangerous by the presence of more than one line of poles on one side of the street; and for the purpose of securing a moderate degree of safety, at least, pending the placing of the wires in the subways, to urge the immediate enforcement of rules II. and III. of your Board, which say that "No two lines of poles bearing conductors of a like class shall be erected on any street or avenue," and "No two lines of poles shall be erected on the same side of any street or avenue."

In many cases when directed to attach their wires to other poles to which they approach too closely if not insulated and supported, the owners have replied that they are not allowed to do so, by the owners of the poles. This leaves an enormous number of wires in a very dangerous condition, and permits the electrical companies to maintain two and, sometimes, three poles side by side to support the various classes of wires, all of which take the same route and should be run on a single line of poles.

Very respectfully,

S. S. WHEELER, Electrical Expert.

Commissioner Gibbens moved the following resolution:

Resolved, That the subject of the communication just read be referred to a committee of one and that he be directed to ascertain the opinion of the Attorney-General as to the powers of the Board and, in connection with that, whether two lines of poles should remain on the same side of any street or avenue where subways are not prepared.

Unanimously adopted.

President Hess appointed Commissioner Gibbens such a committee.

The following communication was read:

NEW YORK, July 2d, 1888.

The Board of Electrical Control:

GENTLEMEN:—To facilitate the work of the Department of Public Works in conjunction with your Electrical Expert's Department, in removing "dead" wires, poles, &c., I beg to make the following recommendation:

That the Board authorizes the Electrical Expert to cause a printed notice or paster to be affixed to or near all poles, fixtures, wires, &c., which are found or declared by the Board to be "dead," out of use, or otherwise extant in violation of the rules—said notice to contain warning that if the objectionable wires, fixtures, &c., are not removed or made to conform to the rules immediately the Department of Public Works will be requested to remove them.

Respectfully,

S. S. WHEELER, Electrical Expert.

Commissioner Gibbens moved the following resolution:

Resolved, That the recommendation made by the Expert that the Board authorize him "to cause a printed notice or paster to be affixed to or near all poles, fixtures, wires, &c., which are found or declared by the Board to be 'dead,' out of use, or otherwise extant in violation of the rules," be approved, and that he be directed to follow it out.

Adopted unanimously.

Expert Wheeler recommended to the Board the following new rule:

DAY CIRCUITS.

All circuits which ever carry a current exceeding 500 volts, between 9 A. M. and 4 P. M., must be painted red for a length of two feet at each insulator.

Commissioner Gibbens offered the following resolution:

Resolved, That the rule entitled "Day Circuits," recommended by the Expert as an addition to be made to the Rules and Regulations, be adopted, and hereafter it be part of the Rules and Regulations, and the Secretary be directed to notify all companies operating conductors of the character indicated therein of the new rule.

Unanimously adopted.

Expert Wheeler recommended to the Board the following other new rule:

NUMBER OF CIRCUIT.

Every Electric Light Wire carried on poles must be indicated by a number plainly marked on each cross-arm under the Insulator.

Commissioner Gibbens moved the following resolution:

Resolved, That the new rule recommended by the Expert, entitled "Number of Circuit," be made part of the Rules and Regulations of the Board, and the companies be notified.

Unanimously adopted.

Expert Wheeler also recommended the following other new rule:

STATIONS.

All circuits must be tested every hour when in operation, and when a ground comes on, effort must be made to remove it at once; failing in this, the current must be discontinued until the insulation is restored.

Commissioner Gibbens moved the following resolution:

Resolved, That the new rule recommended by the Expert, entitled "Stations," be adopted and made part of the Rules and Regulations of the Board, and the companies be notified.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That from and after the first of August, 1888, no company shall do business of Arc Electric Lighting in the City of New York without a Certificate of the Board, granted on the recommendation and after inspection by the Expert of the Board, to the effect that its lines comply with all the Rules and Regulations of the

Board, and that its plant is in proper condition for the doing of its business. The force of the Certificate to continue until changes are made, of which the Board must be notified and approve, or so long as the plant and conductors remain in the same condition as when inspected.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the permit issued by the Board to the Brush Electric Illuminating Company, June 11th, 1888, to repair and keep in repair its lines along the streets where it has been ordered under ground be renewed and the time of its limitation extended up to and including the first day of August, 1888.

Unanimously adopted.

Commissioner Gibbens offered the following resolutions:

Resolved, That the application of Mrs. Silverman to have an electric light in front of her residence, No. 352 W. 23d street, shaded, be referred to the Electrical Expert, and he be directed to communicate as soon as possible with the officers of the Company owning it and ask them, as a favor to Mrs. Silverman, to grant her request.

Unanimously adopted.

Resolved, That, in the matter of the discussion of the "alternating current," the Board appoint next Monday, July 9th, 1888, at 11 o'clock A. M., as the time when arguments pro and con may be brought forward.

Unanimously adopted.

Henry S. Kearny, Chief Engineer of the Board, stated that the work of underground construction was progressing satisfactorily. The Frankfort street branch was about finished; the work that was ordered at the last meeting of the Board on Broadway was started Saturday in two places—Vesey street and Spring street. There was a resolution on his desk calling on the Engineer to examine and report upon the man-holes along the lines of subway; he had made some investigation, but would leave a report to a further meeting of the Board.

Commissioner Gibbens offered the following resolution:

Resolved, That when the Board adjourns it adjourns subject to the call of the Chair, and, unless some prior call is made, it meet on Monday, July 9th, 1888, at 11 o'clock A. M., in the lobby of Wallack's Theatre.

Unanimously adopted.

Adjourned.

[JULY 16, 1888.]

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Monday, July 16th, 1888, at 1 o'clock P. M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

On motion of Commissioner Gibbens, the reading of the minutes of the last meeting was dispensed with.

The following communications were read and directed to be spread on the minutes:

NEW YORK, July 12, 1888.

THEODORE MOSS, ESQ., Secretary Board of Electrical Control, 1218 Broadway:

SIR:—In answer to your letter of the 2d inst., requesting me, on behalf of the Board of Electrical Control, to remove the poles and wires used by the United States Illuminating Company on Broadway, from 14th to 45th street; Sixth avenue, from 18th to 58th street, and the side streets from 23d to 58th streets, crossing these avenues from Broadway to Sixth avenue, I have to state that I have no power to act in the matter until directed by the Mayor to do so.

Very respectfully,

JOHN NEWTON, Commissioner of Public Works.

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,

NO. 18 CORTLANDT STREET,

NEW YORK, July 7th, 1888.

THEODORE MOSS, ESQ., Secretary Board of Electrical Control:

DEAR SIR:—Your favor of 3d instant relative to the condition of the Subways on Broadway, near Ann street, addressed to the President of this Company, has been laid before our Executive Committee, who have directed Counsel to take such measures in the premises as may be necessary.

I will inform you further when the course to be pursued has been decided upon.

Very respectfully,

WILLIAM J. SEFTON, Secretary.

The following application was read:

EXECUTIVE OFFICE

WESTERN UNION TELEGRAPH COMPANY,

NEW YORK, July 6, 1888.

THEODORE MOSS, Sec. Comrs. of Elec. Subways:

DEAR SIR:—Will you kindly extend the time of the enclosed permit for a further period of six months from date and oblige?

THE WESTERN UNION TEL. CO.,

By A. S. BROWN, Sup't.

(Permit referred to in the above communication).

Nov. 30th, 1886.

Permission is hereby accorded the Western Union Telegraph Company to stretch new wires and erect new poles and repair its existing lines, as follows:

Above Harlem River, along the lines of Steam Railroads only.

Good for six months unless revoked by the Board.

For the Board,

THEODORE MOSS, Secretary.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Western Union Telegraph Company "to stretch new wires and erect new poles and repair its existing lines, as follows: Above Harlem River, along the lines of Steam Railroads only," be granted for a period of six months from this date.

Unanimously adopted.

Commissioner Moss offered the following resolution:

Resolved, That the five applications of the East River Electric Light Company, now before the Board, dated respectively March 15, 1888, March 15, 1888, March 28, 1888, June 20, 1888, and July 12, 1888, and the application of the Harlem Lighting Company, dated 1888, to erect poles and string wires, be referred to the Engineer.

Adopted. Vote: Commissioners Hess and Moss "aye"; Commissioner Gibbens declined to vote.

Commissioner Gibbens stated that he understood that the Mount Morris Electric Light Company, since the granting of the recent permit to them, had erected poles on 8th avenue, for some blocks, where there were already existing poles, in violation of the rules and regulations, and he thereupon offered the following resolution:

Resolved, That the Engineer be directed to report to the Board, as soon as possible, whether the Mount Morris Electric Light Company has erected poles in violation of the Rules and Regulations of the Board; and, if so, to state in detail where and how it has erected them in violation of such rules.

Unanimously adopted.

The following report was submitted by the Engineer and Electrical Expert and read:

NEW YORK, July 16th, 1888.

To the Board of Electrical Control:

GENTLEMEN:—Referring to the request of the President of the Consolidated Telegraph and Electrical Subway Company at the last meeting of the Board for permission

to lay the Johnstone System for distributing electrical conductors, and referred to us,

On reference to the resolution of the Board of the 20th of September, 1887, we find, that the Board therein suggested that any company ordered to use the subways might present plans for additions to, or modifications of, the conduits and subways in the matter of making electrical connections therewith, and in default thereof all companies operating arc currents should make such electrical connections by means of "For electric light and power conductors subsidiary iron tubes from the nearest manhole in said subways to the point desired to be reached, and through said iron pipes insulated wires or cables connecting the lines, machinery or termini of overhead lines with electrical conductors in said conduits."

Had any company desired to make electrical connections by means of the Johnstone Distributing System we should have advised the Board to allow it to do so, and, therefore, inasmuch as the Consolidated Telegraph and Electrical Subway Company desires to use said distributing system for some of its prospective customers, we recommend that it be allowed to provide such electrical connections in connection with the arc light subways heretofore constructed, and that the Board approve the Johnstone System of distribution as one of the modes of making electrical connections for arc lighting.

Yours respectfully,

HENRY S. KEARNY, Engineer of Board,
S. S. WHEELER, Elec. Expert.

Commissioner Gibbens offered the following resolution:

Resolved, That the recommendation of the Report of the Engineer and the Electrical Expert, dated July 16, 1888, in reference to the Johnstone Distributing System, be approved, and the Secretary is directed to transmit a copy of such report to the Consolidated Telegraph and Electrical Subway Company.

Unanimously adopted.

The following communications were read and ordered to be spread on the minutes:

NEW YORK, July 16th, 1888.

Honorable Board of Electrical Control, 1218 Broadway, New York City:

GENTLEMEN:—For your information we beg to send you the accompanying sample of the 8 conductor arc light cable which we are making for the Brush Electric Illuminating Company, of New York, to be used in the New York Subway between 14th and 35th St. in Broadway.

Very respectfully,

STANDARD UNDERGROUND CABLE CO.,

Per G. L. WILEY, Mgr.

JULY 16, 1888.]

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NEW YORK, June 21st, 1888.

HON. JACOB HESS, President Board of Electrical Control, 1218 Broadway, New York City:

SIR:—I am about to commence an action against the United States Illuminating Company to compel it to comply with the requirements of the resolution adopted by your Board on September 20th, 1887, and to remove from the streets and avenues mentioned in said resolution the poles, wires and other electrical conductors and devices.

If your Board should desire to be represented by Counsel in the prosecution of that action, I should be very happy to associate with myself any counsel you may select, providing such association be without expense to the City. The matter is directly in charge of Mr. Francis M. Scott, my Assistant, with whom you, or the members of your Board, or any counsel selected by you, are invited to consult.

Yours very truly,

HENRY R. BEEKMAN, Counsel to the Corporation.

Commissioner Hess stated that, in connection with the communication of the Corporation Counsel just read, he had prepared a letter which would be sent to the Corporation Counsel. The following letter was thereupon read:

NEW YORK, July 13th, 1888.

HON. HENRY R. BEEKMAN, Corporation Counsel Tryon Row, New York:

DEAR SIR:—I have received affidavits in the suit of the Mayor, Aldermen and Commonalty of the City of New York vs. The United States Illuminating Company, and must respectfully decline to sign the same for the following reasons:

First. My understanding of the laws relating to the electrical conductors in the City of New York is to the effect that it is the duty of the Mayor to issue an order to the Commissioner of Public Works to remove the poles and wires from the surface of the streets where in the opinion of the Board of Electrical Control sufficient subways have been constructed underground for the accommodation of the electrical conductors of any company and the company notified of the same for the space of ninety days.

Second. I believe that the suit which you contemplate is unnecessary in the premises, owing to the fact that did the Mayor, Aldermen and Commonalty of the City of New York desire to render the Subway Acts efficient they would have done so more effectually and easily by applying the statute remedy for disobedience to the requests of the Board of Electrical Control.

Third. I believe that the suit as instituted by you is capable of being prolonged indefinitely and places the corporation which refuses to comply with the laws referred to in the best possible position to fight off the execution of those laws as against itself and to find apparently lawful ways of procrastinating and putting off the consequences of its refusal to obey the will of the people.

Fourth. A suit for an equitable relief in a case where a statutory remedy is specially provided is a hazardous proceeding.

Fifth. To institute a suit wherein the rights and powers and acts of a duly constituted State Board are liable to be reviewed and passed upon, without the approval of the said State Board, and without consulting the members thereof as to their opinion in the matter, does not seem to me to be a desirable mode of procedure in any action tending to serve the best interest of the public and the enforcement of law.

Sixth. The refusal of the local authorities of the City of New York to apply the statutory remedy in the case of the United States Illuminating Company, where the said Company has been ordered for nearly a year to place its wires underground, has resulted in forcing the Board of Electrical Control to institute proceedings of a criminal nature against the said Company, which are now pending; to petition the Attorney-General to ask leave of Court to bring an action for the annulment of the charter of the said corporation, on the ground that it has exercised a privilege or franchise not belonging to it and has offended against the provisions of a law applicable to the said corporation. The same failure on the part of the local authorities, acting, no doubt, under your advice, has put back the work of the Board of Electrical Control, in my opinion, more than a year, and has rendered it extremely difficult for the Board to carry out its duties devolved upon it by statute, while it has rendered the corporations who are affected by the acts relating to electrical conductors contumacious, impudent, impatient of authority and in every way less disposed to comply with the provision of public statutes.

I would gladly aid you, or any other public officer, in bringing about an early practical solution of the difficulties we are met with by corporations who will not obey the laws, but for the reasons above stated I cannot consent willingly to become a party to the proceedings which you have instituted, nor will I, of my own volition, do anything which may tend to assist you in the prosecution of this suit, or by my action appear to encourage the substitution of such an action for that of a determined effort on the part of the municipal authorities to apply the remedial provisions of the Acts which they themselves drew up and recommended to the Legislature for its action. I have the honor to be,

Very respectfully,

JACOB HESS, President of the Board of Electrical Control.

The following communication was read:

THE HARLEM LIGHTING CO.,

NEW YORK, July 10th, 1888.

Mr. KEARNY, City:

DEAR SIR:—The Harlem Lighting Company is using a carrying pole of iron which is very weak and hardly able to bear the wires; neither is it strong enough to do the service properly because the slightest contact with it breaks it, and as this is fraught with great danger, I think it best for the company, even at a considerable expense, to substitute wooden poles for those now in use. I submit this to you for your consideration. I beg to state that the company is ready to make the substitution, provided the Board so advises.

Yours respectfully,

ABRAM C. BERNHEIM.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to issue a permit to the Harlem Lighting Company to substitute new poles for old ones; said new poles to conform to a plan to be submitted to and approved by the Engineer and the Expert of the Board before erection.

Unanimously adopted.

President Hess moved the following resolution:

Resolved, That the sample of the 8 conductor arc light cable being made for the Brush Electric Illuminating Company by the Standard Underground Cable Company, sent to the Board by said last mentioned Company, be submitted and referred to the Expert for his opinion and report.

Unanimously adopted.

Expert Wheeler made the following reports, which were read and directed to be spread on the minutes:

REPORT OF ELECTRICAL EXPERT FROM JUNE 27th TO JULY 15th, 1888.

Notices of Violations of Rules and Regulations.

Name of Company.	No. Violations of R. & R.	Dangerous Circuits.	Dead Wires.	Low Lamps.	Violations of R. & R. B. F. U.	Other Violations.	Dead Poles
U. S. Ill. Co.	157	..	122	2	..	31	2
Brush E. Ill. Co.	64	..	40	..	..	4	20
W. T. U. Co.	5	..	5	..	..	..	..
Met. T. & T. Co.	19	..	19	..	..	..	..
B. & O. T. Co.	2	..	2	..	..	..	..
Owners Unknown.	13	..	3	..	..	..	10
East R. E. L. Co.	15	..	15	..	..	..	..
	<u>215</u>	..	<u>206</u>	<u>2</u>	..	<u>35</u>	<u>32</u>

REPORT OF ELECTRICAL EXPERT.

Detail of all Notices of Violations of Rules and Regulations sent from June 15th to July 15th, 1888.

	Total No. of Violations.	Notices sent.	2d Notice.	Notices Answered.	Notices Attended to.	Notices sent to Bu. of In.	Notices Referred to Board.
U. S. Ill. Co.							
Dead Poles	64	28	7	1	..	9	1
Dead Wires	252	151	50	25	17	46	10
Dead Fix's and Wires	26	25	11	6	1	1	2
Lamps Low	14	16	11	2	1	..	1
Insulation of Wires	37	32	1	14	23	..	1
Broken Globes	3	3	..	..	..	..	..
Poles Unmarked	50	7	1	..	1	..	..
Totals	446	262	84	53	48	56	15
Total Notices Sent		346					

	Total No. of Violations.	Notices sent.	2d Notice.	Notices Answered.	Notices Attended to.	Notices sent to Bu. of In.	Notices Referred to Board.
Brush E. L. Co.							
Dead Poles.....	18	5	1	..	2	3	..
Dead Wires.....	27	22	..	14	10	..	4
Dead Fix. and Wires.....	23	20	..	4	7	..	1
Lamps Low.....	11	7	1	4	2	..	3
Insulation of Wires.....	16	16	10	2	4	..	..
Poles Unmarked.....	2	2	2	..	..	..	..
Dangerous Poles.....	1	1	1	..	..	..	..
Totals.....	78	63	25	24	25	3	8
Total Notices Sent		88					
East River Ill. Co.							
Dead Wires.....	13	11	..	..	..	..	..
Lamps Low.....	1	1	1	..	..	..	..
Insulation of Wires.....	1	1	..	..	..	..	..
	15	13	1	..	..	..	..
B. & O. T. Co.							
Dead Wires.....	2	2	..	..	1	..	..
Dead Poles.....	2	1	..	..	1	..	..
	4	3	..	..	2	..	..
Western U. T. Co.							
Dead Wires.....	12	8	..	..	3	..	..
Dead Cables.....	2	2	..	..	1	1	..
Dead Poles.....	2	1	..	..	1	..	..
	16	11	..	..	4	1	..
Metropolitan T. & T. Co.							
Dead Wires.....	15	15	1	2	10	..	..
Grand Total of Violations ..	675						
Grand Total of Notices....		468					

The Expert recommended the following new rules:

LOOPS.

No unused loops from electric light circuits shall be allowed to remain after lamps are taken away, except in cases where it is positively known that the lamp will be required again within three months and where there is no underground conduit for that class of circuits.

LINEMEN.

All linemen must wear a badge in a conspicuous place giving the name of the company, by whom they are employed, and a number.

Commissioner Gibbens offered the following resolutions:

Resolved, That the new rules recommended by the Expert, entitled, respectively, "Loops" and "Linemen," be added to the Rules and Regulations.

Unanimously adopted.

Resolved, That the Board do now adjourn to the lobby of Wallack's Theatre, which has been placed at our disposal by the kindness of Commissioner Moss, and, after hearing the arguments relating to the "alternating current," that the Board adjourn subject to the call of the chair.

Unanimously adopted.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Wednesday, August 8th, 1888, at 11 o'clock, A. M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

On motion of Commissioner Moss, the reading of the minutes of the previous meeting was dispensed with.

The following communications were read:

HOFFMAN HOUSE, BROADWAY, MADISON SQUARE,

NEW YORK, 28th July, 1888.

THEODORE MOSS, Secretary of the Board of Electrical Control:

DEAR SIR:—On the 26th instant we sent to his Honor Mayor Hewitt the enclosed communication which explains itself; and we trust your Board will do all in your power to aid us in removing the poles and wires in front of our hotel.

Yours respectfully,

C. H. READ & CO.

HOFFMAN HOUSE,

NEW YORK, July 26th, 1888.

To the HON. ABRAM S. HEWITT, Mayor, City Hall, New York:

DEAR SIR:—The Board of Electrical Control in and for the City of New York have, according to law, provided subways for electrical conductors underground in 25th street, between Broadway and Sixth avenue, and, as we are informed, have served notice upon certain companies more than ninety days since to place their electrical conductors in these subways so provided.

We understand that, on the expiration of such a ninety days' notice from the Board of Electrical Control, it rests with your Honor to issue an order to the Commissioner of Public Works to remove the poles and wires of companies not obeying the notice, and that you have only refrained from so doing in the case of the poles and wires on 25th street because, in your opinion, no proper or specific appropriation has been made to enable the Commissioner of Public Works to carry out your order, should you so give it.

[August 8, 1888.]

We are lessees of valuable property upon 25th street, between Broadway and Sixth avenue, and also residents of that street, and, in the public interest, which, I believe, will be greatly furthered by vigorous action on your part in this matter, as well as for the reason that our guests are annoyed and property endangered by the existence above ground of these improperly insulated wires carrying deadly currents, we have concluded to defray the entire expense of removing the poles and wires of all electrical companies on 25th street from Broadway to Sixth avenue. If you will kindly issue the necessary order to the Commissioner of Public Works we will send our check for such sum as may be necessary to perfect the removal.

Hoping to receive a speedy and a favorable reply, we have the honor to be, with great respect,

Yours very truly,

C. H. READ & CO., Prop. of the Hoffman House.

MAYOR'S OFFICE,

NEW YORK, July 27th, 1888.

MESSRS. C. H. READ & Co., Hoffman House, City:

SIRS:—I am in receipt of your letter of the 26th instant, in which you state that an order has been given by the Board of Electrical Control for the removal of the electrical poles and wires in 25th street, between Broadway and Sixth avenue, and that ninety days have expired since such order was made. You also state that I decline to issue the order to the Commissioner of Public Works to remove the poles and wires of the companies not obeying the notice, on the ground that the Commissioner of Public Works has no funds under his control available for the execution of the order if given. You offer to defray the expense which may be incurred by the Commissioner of Public Works in the execution of the order if given.

In reply I beg leave to state that the absence of an appropriation available for the purpose of removing poles and wires was only one of the reasons for which the Mayor refused to give the order requested. It was in itself a sufficient reason, which, however, would be removed by your offer to pay the cost, provided it is proper for the city government to indemnify itself for the expense in the way in which you propose. As to this point, it is not necessary for me to come to any conclusion; inasmuch as there are other reasons outside of the cost sufficient in my mind to cause me to refrain from giving the order requested. I do not know whether the poles and wires referred to are used for lighting 25th street, between Broadway and Sixth avenue, or for transmitting the current to conductors employed in lighting other streets under contract with the city. If they are so used, I would feel justified in depriving the citizens of New York of lighted streets and of making it impossible for the Company to fulfill its contract with the city. If the poles and wires are not used for the transmission of electrical currents, then they are dead poles and wires, and can be removed by the Department of Public Works on application from you, and I have heretofore requested the Commissioner in all such cases to use the means at his command for the abatement of such obstructions. An application from you to the Commissioner of Public Works will doubtless lead to a prompt exercise of authority on his part, after due inspection as to whether poles and wires are dead or alive.

Lest my attitude in this matter be either misunderstood or misrepresented, I wish to state that there are legal questions involved in the controversy between the Board of Electrical Control and the Electric Light Companies which ought to be settled by due process of law; that I have instructed the Counsel to the Corporation to bring

a suit, and press it to a conclusion, in order that the relative rights of the city and of the Companies may be definitely settled. The papers in this suit have been prepared, but the President of the Board of Electrical Control has refused to verify the complaint. The consequence is that action is delayed, and you and other citizens, who complain justly of annoyance and obstruction, are subjected to delay by reason of the indefensible position taken by the Board of Electrical Control upon this subject. It depends upon that Board, and not upon me, whether the law shall be enforced. The Mayor has no judicial powers, and he would be untrue to his obligations to the citizens of New York if, when important legal questions are raised, he were to proceed with a high hand to destroy the property of those who have placed him in office for its care and protection. You, as proprietors of a very large establishment, would be the first to complain if the Mayor, in the exercise of arbitrary power, were to interfere with what you claim to be your legal right; and you will recall the fact that when the Mayor was urged to close up your establishment on Sunday, as to certain of its functions the Mayor took precisely the same course which he is now taking in regard to the Electric Light Companies, by recommending that a friendly suit be brought, and the matters in dispute be submitted to the prompt judgment of the courts. This course was pursued, to the eminent satisfaction of yourself, of the Mayor, and of the citizens generally. All bitter feeling was avoided and the law was vindicated. If the Board of Electrical Control will act as sensibly as you and your associates did in the excise cases, a very early solution of the existing controversy will be had, and all parties will receive that measure of justice to which, under the law, they are entitled.

Yours respectfully,

ABRAM S. HEWITT, Mayor.

Commissioner Gibbens moved the following resolution:

Resolved, That the communications which have been read be spread on the minutes, and that the following answer be sent to Messrs. C. H. Read & Co.:

NEW YORK, August 8th, 1888.

MESSRS. C. H. READ & Co., Hoffman House, New York:

GENTLEMEN:—The Board of Electrical Control has received your letter of the 28th ult., enclosing a copy of a letter to the Hon. Abram S. Hewitt, in which you offer to provide the necessary funds to remove the poles and wires from above ground which exist about your premises without authority of law, and which have been ordered removed for upwards of eight months by this Board.

I am directed by the Board to thank you sincerely for your evident disposition to assist in the work for which the Board was constituted, and to assure you that the Board will do everything in its power to bring about the removal of these poles and wires which threaten your lives and property and annoy your guests.

It is, perhaps, unfortunate that the Board has not the power summarily to sweep from the streets the poles and wires of companies for whom underground accommodations have been provided, but who have failed to comply with the provisions of the Act requiring them to make use thereof. The Legislature, in its wisdom, desiring to interfere as little as possible with the duties of the local authorities of the city, made it the duty of the Commissioner of Public Works to apply and carry out the remedial clause of the law, upon the order of the Mayor; and had the Mayor of the city issued such an order to the Commissioner of Public Works five months ago there can be

no question but that the obnoxious structures would have been removed, and companies operating overhead conductors would now be doing their business with underground wires. The failure of the Mayor to perform his part and duty under the Act has put off and retarded the accomplishment of the work contemplated and authorized by the Legislature, and placed the Board of Electrical Control, as well as the citizens of New York, in the unpleasant position of being obliged to have constantly before their eyes the spectacle of corporations wilfully, maliciously and inexcusably defying and disobeying the will of the people and the law of the land.

The reply of the Mayor to your communication is also before the Board, in which we find reiterated the same oft-repeated excuses which he is in the habit of making for not performing his duty under the Act of 1887, and which have so many times been met, and the absurdity of which has been so frequently exploited by the leading newspapers of the city, as well as by the correspondence between his Honor and this Board. The following extracts from the editorials of the "Times" and "Herald" explain the situation admirably:

"The failure of the Mayor to order the removal by the Department of Public Works of the poles and wires of companies which have refused to make use of the subway already completed, and have ignored the ninety days' notice given them by the Board of Electrical Control, has been explained by him on the ground that Commissioner Newton has no money appropriated for doing this special work. So far as the poles in Twenty-fifth street, between Broadway and Sixth avenue, are concerned, this excuse, if it had validity, which good lawyers doubt, will be valid no longer. The proprietors of the Hoffman House have become weary of the nuisance which annoys their guests and is a constant menace to their property, and they have written to Mayor Hewitt asking him to order the poles removed as the subway law provides, and tendering their check to the Department of Public Works to cover whatever expense may be incurred in the work.

"It is somewhat humiliating that private citizens should thus feel called on to contribute, in addition to the payment of their taxes, money for doing what the Legislature in passing the Subway Act made it the business of the Municipal Government to do, but as Mayor Hewitt doubts the legality of any use of the city money for removing these obnoxious poles it is perhaps as well that some public spirited citizens should take the matter in hand. There can be no reasonable objection to the acceptance of the offer of private funds which has now been made. If a beginning can be made in the removal of the poles and wires in this manner, possibly the city government will at last awake to the fact that our citizens are determined to get rid of the nuisance, and some way will be found to comply with the plain provision of the subway law."

"There has been an endless amount of talking, letter writing, explaining, promising, suggesting, seeking legal advice &c., about getting the wires under ground. Mayor Hewitt's latest letter on the subject was written only yesterday. Meanwhile, as a natural result of this policy of inactivity and delay, the wires hang overhead as much of a nuisance as they ever were, and they will long hang there if their burial must await the result of legal proceedings which the Mayor has directed the Corporation Counsel to institute.

"The strangest thing about all this business and most obvious course of dealing with the matter has not been taken. That course is simply to do what the law plainly directs to be done. It provides for building the conduits. It next declares that when

they are ready for the reception of wires the companies shall be officially notified. The duty then devolves upon the companies to put their wires in the conduits. If they refuse or fail to do so the law makes it the duty of the city authorities to remove the standing poles and wires.

"And the law makes it the duty of the Mayor to serve a written order on the Commissioner of Public Works, who is 'to cause the same to be removed forthwith by the Bureau of Incumbrances.'

"That is plain and practicable. Up to a certain point the law has been followed. Conduits have been prepared. The companies have been notified. They have failed to put their wires under ground. Ninety days have elapsed since the notice was served on them.' At this point it becomes the duty of the public authorities to act.

"The next step is now to be taken by the Mayor. That step is to order the Commissioner of Public Works to move in the matter. Without that order neither the Commissioner nor the Bureau of Incumbrances can act. They must wait for the Mayor's written order.

"The Mayor has persistently refused to give that order. This refusal arrests the operation of the law, blocks the work, leaves the poles and wires standing.

"The reason or excuse hitherto given by Mr. Hewitt for his singular attitude is that the Bureau of Incumbrances is short of funds. What concern is that of the Mayor? It is his business to give the order. It is the business of the Commissioner of Public Works and the Bureau of Incumbrances to carry it out. Whether or not they have the means to do so is their affair, not his. If they fail the responsibility is theirs, not his.

"Let Mr. Hewitt perform the duty imposed by law on the Mayor of New York. That duty is as imperative and at this time as important as any attached to his office. If its performance does not bring about the removal of the wires from the streets it will then be in order to consider what course to take next."

The Mayor states in his letter to you "that there are legal questions involved in the controversy between the Board of Electrical Control and the electric light companies which ought to be settled by due process of law." In reference to this and to the suit which the Mayor has had instituted to settle these questions, we desire to say that the only matter in controversy between the Board of Electrical Control and any persons or corporations whatsoever is, Whether or not the Act relating to electrical conductors in the City of New York shall be carried out. All electrical companies are substantially with the Board upon this question but one; and all the people of the city, as far as we can judge from the expressions of the press, are also with us, with the exception of his Honor the Mayor, and the few others who seem to be of the opinion that the way to carry out a law is to throw all the obstacles possible in the way of its enforcement and all the obloquy possible upon those who are endeavoring to execute it.

If it had been the intention of the Legislature to make Abram S. Hewitt the controller of the electrical conductors in the City of New York it would, no doubt, have found language sufficiently precise to enable it to do so. What the Legislature did in reality was to impose upon the Mayor of the city a duty, which Abram S. Hewitt refuses to perform, because, as he says in his letter, "The Mayor has no judicial powers, and he should be untrue to his obligations to the citizens of New

York if he were to proceed with a high hand to destroy the property of those who have placed him in office for its care and protection"—as though the United States Illuminating Company, and not the citizens of New York, had made him Mayor—as though he were the legislative power, and it was his duty to pass upon and declare of no account the acts of the Assembly, Senate and Executive.

How different would have been the situation in this city to-day if the Mayor had proceeded as did the Mayor of another large city in this country, under similar circumstances, when he drove the Western Union Telegraph Company beyond the limits of the city and forced it to establish its only terminus in that city in a stock yard until it had placed its conductors under ground. As has been many times declared—the best way to do a thing is to do it—and no amount of sophistry or false logic or criticism of other public officers can excuse the evident neglect of duty which has characterized Abram S. Hewitt in his relation to the electrical companies and the Board of Electrical Control.

As to the suit which he claims will be the panacea for all the woes of the citizens—in this matter we would say, as the President of the Board said in his letter to the Corporation Counsel—that while we believe the city has good ground for such an action, it does not seem the proper way to proceed, in view of the remedy provided by statute. To apply the statutory remedy would be the work of but a day. To decide a suit brought to obtain an equitable relief in a case where constitutional objections can be raised is a matter which might, and probably will, be prolonged for years without result. The following extract from the editorial columns of the "World" is not an illogical view of this matter:

"A suit is to be filed forthwith by the Corporation Counsel against the electric light companies to compel them to put their wires under ground, in accordance with the requirements of the law, wherever the conduits are ready to receive them. This is the suit suggested by Mayor Hewitt, who has steadily obstructed the work of the Board of Electrical Control.

"It is singular that the companies which fight against obeying the law, and the Public Works Department, which seeks how to evade doing any act against the wishes of the companies, seem to feel entire confidence in this suit, and to have no fear that it will be decided against the interests of the corporations. The United States Illuminating Company yields to the orders of the Board not to light its lamps on the line of the finished subway, expressing its entire willingness to await the result of this suit. The Public Works Department, after some disgraceful quibbling over the removal of unnecessary poles and dead wires, says that it has made up its mind to take no action until the suit is decided.

"Would it not be a desirable precaution to put the management of this suit into other hands than those of the Corporation Counsel? The known hostility of the Mayor to the Subway Commission and the relations of the Corporation Counsel to the Mayor may excite a suspicion that the suit will not be effectively prosecuted. Would it not be more satisfactory to the people if their interests in this matter were to be looked after by some lawyer not under Mayor Hewitt's control, especially as the President of the United States Company gives notice that when the suit fails he intends to immediately prosecute a claim for 'heavy damages' against the city?"

The Mayor declares in his correspondence with you that if the poles and wires referred to are "dead" or not in use, or unnecessary to the business of the companies, the Department of Public Works will remove them. The credulity of the Mayor

as to the efficiency of the Department of Public Works in matters of this kind is characteristically entertaining. During the past month—that is to say, from July 5th to August 5th—the Board of Electrical Control has communicated to the Department of Public Works 122 notices of dead poles and wires and poles and wires not in use and requested that Department to remove the same. These notices cover 291 poles, which are unnecessarily encumbering and obstructing the streets of the city, and hundreds of miles of wire, which are a constant menace to the lives and property of all of us. Each day adds to the number of poles and wires which the Department is requested to remove. The very pole line on the north side of 25th street, between Broadway and Sixth avenue, of which you complain, has been reported to the Department of Public Works as carrying five “dead” wires out of ten altogether on the poles. Notwithstanding all this, nothing has been done by the Department toward removing these street obstructions, and the close of every day, without action, adds to the audacity and security of the corporations, which can violate the law of the land with apparent impunity so long as Abram S. Hewitt is at their back with all the machinery of the city government to invent legal complications and throw obstacles in the way of its enforcement.

But despite the serious difficulties with which the Board of Electrical Control has to contend, we, nevertheless, pledge you our best efforts and ultimate success in removing from about your premises these poles and wires which should have been removed long since. We are retarded in our work; we are seriously disabled from performing our duties, as we understand them, by the action and inaction of the Mayor. We are crippled; and the power that should uphold our hands is bent upon dragging them down. But we are not discouraged or dismayed; on the contrary, opposition serves to render us more alert and earnest. We believe that where there is a right there is a remedy; and where a wrong has been done, by vigilance and earnest effort punishment can be imposed upon the offender.

We are proceeding as rapidly as possible to test the efficiency of criminal proceedings against the contumacious corporation which refuses to comply with the statutes applicable to it, feeling assured that though our work be delayed it cannot be prevented of accomplishment, and that we shall in due time, by slow legal processes in place of the rapid and effective course authorized by the Legislature, effect the same end, and bring to you and the other citizens of New York the relief from this overhead wire nuisance to which you have so long been entitled.

Thanking you again for the effort you have made and the interest you have displayed, I have the honor to be,

For the Board of Electrical Control,

THEODORE MOSS, Secretary.

Unanimously adopted.

The following communication was read:

NEW YORK, August 7th, 1888.

HON. THEODORE MOSS, Commissioner and Secretary, Board of Electrical Control:

SIR:—It is quite important that your Board should understand what the course of this Department will be as to the removal of dead wires, so called, with their poles, and unused devices. Owing to a dispute between the Board of Electrical Control

and the United States Illuminating Company, concerning the status of certain wires complained of by the Board, as dead wires, and asserted by the Electric Company to be a part of their illuminating system, with the additional statement that there was no subway along the lines of the wires complained of, I referred the matter to the Corporation Counsel to request of him to state who was to be the judge of the condition of the wires—whether they were dead or alive, with the poles and their devices; and his reply was, that this Department should collect the best evidence in its power and act upon that; and if the evidence were not satisfactory to the Commissioner of Public Works, he should refuse to remove them.

I have another subject to call to the attention of your Board: In your letter of August 1st you make the remark that "The Board has sent to your Department within the last six weeks some hundred odd notices of dead poles and wires." I think you are mistaken. The notices that you speak of were not sent to the Department; and were addressed to the Bureau of Incumbrances. They were signed by S. S. Wheeler, Electrical Expert. We have no evidence here that he is the officer of your Board authorized to conduct correspondence with this Department. These communications were not, with hardly an exception, addressed to the Commissioner of Public Works, or to the Department of Public Works, but were addressed to a Bureau; and it has only been since the receipt of your letter that I have seen these communications, after specially calling for them. It is not sufficient to address these communications to a Bureau of this Department, leaving it to chance whether the Commissioner should see them or not within a reasonable time.

After obtaining a sight of the notices I directed the Superintendent of Incumbrances, notwithstanding the informality mentioned, to proceed as usual; but valuable time has already been lost.

Very respectfully,

JOHN NEWTON, Commissioner of Public Works.

Commissioner Gibbens moved the following resolution:

Resolved, That the communication of the Commissioner of Public Works be laid on the table.

Unanimously adopted.

On motion of Commissioner Gibbens, the following communication was ordered to be spread on the minutes:

THE BRUSH ELECTRIC ILLUMINATING CO. OF N. Y.,

204-210 ELIZABETH ST.,

NEW YORK, July 14th, 1888.

Board of Electrical Control, 1218 Broadway, New York City:

GENTLEMEN:—According to your request, we have this day removed the following poles:—

20th Street, between Broadway and 4th Avenue, three poles.

12th Street, between Broadway and 6th Avenue, two poles.

11th Street, between Broadway and 6th Avenue, two poles.

We will in a day or two submit to the Electrical Expert some insulated wire. This Company has been at work for some six weeks effecting the insulation and we hope in a day or two to have some samples ready for your approval. This wire will be water-proof, fire-proof and withstand a large amount of rubbing and chafing without affecting the insulation; the insulating qualities we find to be very high.

If this wire meets with your approval we will take down about one-fifth of the wire we now have in the city and replace it with a wire that we trust will meet the requirements.

Yours respectfully,

W. H. McGRATH, Supt.

Commissioner Gibbens offered the following resolution:

Resolved, That the three communications before the Board from parties interested in the "alternating current" be placed with the other communications of the Board on the same subject, as a record.

Unanimously adopted.

Commissioner Gibbens stated that he had received a letter from Robert G. Reilly, who was appointed an Inspector to this Board, in which letter he declines to serve as such, having received a better offer. The Commissioner offered the following resolution:

Resolved, That the next name on the list of the Civil Service Report, to wit, that of Christopher P. Reilly, be accepted and adopted in place of that of Robert G. Reilly.

President Hess moved to amend the resolution of Commissioner Gibbens by substituting the name of M. B. Field in place of Christopher P. Reilly.

Amendment lost. Vote: Commissioner Hess "aye"; Commissioners Gibbens and Moss "no."

The original resolution of Commissioner Gibbens was then adopted by a unanimous vote.

The Board directed the Secretary to inform the Civil Service Board of the appointment of Christopher P. Reilly and ask for another list of names.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to address a letter to the Honorable, the Board of Aldermen of the City of New York and to inform the honorable gentlemen.

First. That "dead" wires and poles and wires and poles not in use and wires and poles which have never received the proper sanction of the local authorities of this city exist in the streets and avenues of the city of New York unlawfully.

Second. That the rules and Regulations of the Board of Electrical Control are violated.

Third. That the violations of the Rules and Regulations of the Board of Electrical Control has led to fatal accidents and the recommendation of a Coroner's Jury, within a day or two, to the effect that some city ordinance should be passed for the more effectual insulation and better construction of electric light conductors.

And that the Secretary also enclose to the Honorable Board of Aldermen a copy of the tabulated statement of the violations of the Rules and Regulations which have been found by our inspectors, together with a list of other cases of "dead" poles and wires to which the attention of the Department of Public Works has been called.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the President of the Board be appointed a committee of one to confer with the Boards of Fire and Police, and report as soon as possible, as to the prospect of placing under ground of the wires belonging to those Departments.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That a committee of two be appointed by the Chair to bring in a report on the granting privileges to Electric Light Companies on streets where there are no subways.

That such report shall be based on the principle of the fullest and fairest concession to all companies to enable them to serve their customers and extend their lines with the least number of poles and wires consistent with the same, and all poles and wires to be uniform and safe and to be constructed under general restrictions to be formulated by said committee.

That pending such report all permits now extant and not acted on be revoked.

Commissioner Moss moved to amend the resolution of Commissioner Gibbens by striking out its last paragraph, to wit: "That pending such report all permits now extant and not acted on be revoked."

Amendment adopted. Vote—Commissioners Hess and Moss "aye"; Commissioner Gibbens "no."

Original resolution of Commissioner Gibbens, as amended, adopted by a unanimous vote.

President Hess appointed Commissioner Gibbens and Moss as the committee of two "to bring in a report on the granting privileges to Electric Light Companies on streets where there are no subways."

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to notify the different companies operating electrical conductors to call the attention of this Board to all "dead" wires which come under their notice, with a view to their removal by the Department of Public Works.

Unanimously adopted.

Commissioner Gibbens stated that the Board of Electrical Control had suffered considerably from a discussion which was brought about principally through the efforts of Mr. Brown, an electrical engineer, and with which he had something to do by offering a resolution that the Board go into the subject. The Board had been pretty thoroughly convinced—he thought—that the alternating current would kill, and it knew before hand that the continuous current would kill. That was about all the Board cared to know in connection with the subject, and he would now move the following resolution:

Resolved, That, from the recommendations which have been made to the Board, and which are now on the records of it, by the advocates of these different systems of electric lighting, and by the gentlemen who have so kindly and scientifically aided us with information upon the subject, our Expert report to the Board, as soon as possible, such precautionary measures as it seems to him desirable the Board should adopt in allowing these currents, both alternating and continuous, to be used in the City of New York.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the rule entitled "Certificate of Inspection," passed at a meeting of the Board held July 2, 1888, and to the effect that from and after the first of August, 1888, no company shall do business of arc electric lighting in the City of New York without a certificate of the Board, be suspended until such time as the Expert shall report thereon.

Unanimously adopted.

Commissioner Gibbens, after stating that he understood the Department of Street Cleaning was very anxious to have its dumps lighted by the electric light, moved the following resolution:

Resolved, That the committee which is authorized to report on the electric light question be also authorized to issue a permit to the Department of Street Cleaning upon the application of that Department, if it desires it, to string wires for the purpose of lighting its dumps.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to communicate with the President of the United States Illuminating Company and invite his attention once more to the fact that the wires and poles being "dead" in this district where the Board has prohibited this Company from making any repairs to its lines is an additional reason why they should be taken down; and, in case this reply is not attended to promptly, that the committee which has been appointed to prosecute the Company criminally for other violations be authorized to make up cases in this respect against it.

Unanimously adopted.

President Hess offered the following resolution:

Resolved, That the Engineer report to the Board, at its next meeting, to what extent the work ordered by the Board during the present year has been done by the Consolidated Telegraph and Electrical Subway Company.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the thanks of this Board are due and extended to Dr. Watts for his kindness in supplying us with very handsome badges. That the favor at the hands of the Doctor be gratefully accepted, and the Secretary be directed to write him a letter and thank him for his courtesy.

Unanimously adopted.

Commissioner Hess offered the following resolution:

Resolved, That, in cases of special emergency, for public lighting, the committee of two appointed under the resolution in reference to granting privileges to electric light companies, passed at this meeting, have the right to act without report to and without the authority of the Board.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Friday, September 7th, 1888, at 2 o'clock P. M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

On motion of President Hess, the reading of the minutes of the last meeting was dispensed with.

The following communication was read:

NEW YORK, September 7th, 1888.

To the Honorable, the Commissioners of the Board of Electrical Control, HON. JACOB HESS, President, No. 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We beg leave to submit the following subway lines which are needed to meet the requirements of the Metropolitan Telephone and Telegraph Company, and to respectfully recommend them to the consideration of your honorable Board for authorization, the same to be constructed during the present season:

First. A subway on Hudson Street from Worth to Canal Streets.

Second. A subway on Worth Street, from Hudson Street to Bowery.

Third. A subway on Centre Street from Worth to Reade Streets.

Fourth. A subway on Bowery from Worth to New Chambers Streets.

We desire to recommend that wrought iron pipe, to be laid in hydraulic cement concrete, as used in the rest of the down town district, be ordered by your Board for these lines, which should be permanent. I submit herewith a map showing the above lines.

Very respectfully,

EDWARD LAUTERBACH, President.

Commissioner Gibbens offered the following resolution:

Resolved, That the request of the Consolidated Telegraph and Electrical Subway Company for authorization to construct subways

On Hudson Street from Worth to Canal Streets,

On Worth Street from Hudson Street to Bowery,

On Center Street from Worth to Reade Streets,

On Bowery from Worth to New Chambers Streets,

be granted, subject to the approval of the Engineer of the Board as to the number of ducts and method of construction.

Unanimously adopted.

Commissioner Moss moved the following resolution:

Resolved, That this meeting be adjourned until the 18th day of September, 1888, at 2 o'clock P. M.

Unanimously adopted.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Tuesday, September 18th, 1888, at 2 o'clock P. M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of the previous meeting were read and approved.

Electrical Expert Wheeler stated to the Board as follows:

Since the last report of the Expert the Department of Public Works has begun work in removing wires and poles, and up to date it has reported about one hundred and thirty poles and about one hundred miles of wire. Inspectors have been at work looking up the lines that could be removed, and they found a great many additional ones; many of the companies—all except one—assisting in the work, and have pointed out lines that could be removed. The Brush Company, the Fire Department and the Metropolitan Company have all been hard at work cutting here and there a straggling wire off their lines so the rest could come down. They have apparently done all in their power to facilitate the work.

The first work was taking down a few poles located at different places about the city. The last part of the work has been on Sixth Avenue where there is a line of abandoned poles belonging to the Manhattan Company, a practically extinct Company. This is a heavy line of poles, and has a great many wires. These poles have been taken down from 34th to 50th streets, and they are now being taken down from 50th to 58th streets; and after that they will be taken down from 34th to 21st streets; and then when the Telephone Company, who have a few remaining wires from 21st street to Amity street, have time to remove those, the rest of the line will come down to the end of Sixth avenue. The Fire Department, the Brush Company and the Metropolitan Company are busy clearing these poles so they can be taken down, and it is perfectly evident these companies have all done what they could to facilitate the work.

There were a few poles on Broadway that were unnecessary, and those have been taken down. Some of them were occupied by the Fire Department, and that Department went to the trouble of getting its wires off these poles so they could be taken down. I looked up this line of poles on the east side of Broadway. They are owned by the Western Union Telegraph Company. It will take some little time to get the wires all off, but the owners express a desire to get them off as soon as they can and let the poles come down.

In the work of taking down the Sixth avenue line of poles we have found two pole lines running west of Sixth avenue and 41st street. They both belonged to the Western Union Company. I informed this Company one afternoon of the existence of this line, and the next morning the poles were down.

In Second avenue fifteen or twenty poles have been taken down. The Western Union Company have three different lines of poles in 46th street, and these should be consolidated into one. I have no doubt the Company will take steps at once to have this done.

The following communications were read:

NEW YORK, August 8th, 1888.

The Board of Electrical Control:

GENTLEMEN:—To meet the demands of electrical service in various parts of the city, it is absolutely necessary to place more than one class of wires on a single line of poles before any approach to a safe and workmanlike condition of the wires now above ground can be had.

I would therefore recommend, in connection with my letter to the Board of July 2d, relating to Rules II. and III., that no further permits for erecting poles or stringing wires be granted until the applicants make some satisfactory agreement concerning the common use by other parties of the poles, which they propose to erect, when necessary, in the opinion of the Board.

Very respectfully,

S. S. WHEELER, Electrical Expert to the Board.

NEW YORK, September 5th, 1888.

Board of Electrical Control:

GENTLEMEN:—I would recommend the following addition to the Rules of the Consolidated Telegraph and Electrical Subway Company as a guide, the standard of which may be altered if found by experience to be unnecessarily high or dangerously low:

ELECTRIC LIGHT CABLES.

No two or more conductors having a difference of potential exceeding 500 volts shall be placed in the subways if made in a single cable. This applies to the outgoing and incoming sides of Arc light circuits.

Very respectfully,

S. S. WHEELER, Electrical Expert to the Board.

Commissioner Gibbens offered the following resolution:

Resolved, That the communication of the Electrical Expert, recommending an addition to the Rules of the Consolidated Telegraph and Electrical Subway Company, be referred to that Company for it to bring in a Rule for the approval of the Board.

Unanimously adopted.

The following communication was read:

NEW YORK, September 5th, 1888.

Board of Electrical Control:

GENTLEMEN:—I would recommend the following additions to the Rules and Regulations:

LOW LAMPS.

All arc lamps must be so placed as to leave a space underneath of nine (9) feet clear between lamp and sidewalk when out of doors, and eight (8) feet clear between lamp and floor when in-doors.

Very respectfully,

S. S. WHEELER, Electrical Expert to the Board.

Commissioner Gibbens offered the following resolution:

Resolved, That the Rule entitled "Low Lamps," recommended in the communication of the Electrical Expert read at this meeting, be made part of the Rules and Regulations of the Board.

Unanimously adopted.

The following communication was read, and, on motion of Commissioner Gibbens, ordered to be spread on the minutes:

NEW YORK, August 8th, 1888.

To the Board of Electrical Control.

GENTLEMEN:—The paper and experiments by Mr. Harold P. Brown before your Board, while very interesting, do not bear upon the points in which you are directly interested.

Mr. Brown may have shown that an alternating current is fatal at a lower pressure than an equally fatal continuous current, but the continuous currents now in use are all run at pressures considerably in excess of that which would be fatal, except the Edison incandescent current, and consequently there would be no justice in prohibiting the introduction of the alternating current on account of danger, or even limiting its pressure with a view to safety unless the limit of voltage for every kind of circuit is made so low as to prevent the use of all arc lights, which is hardly a step to be considered at present.

As to the tests made by Mr. Brown to show the voltage required to kill, while they are doubtless correct, and the readings taken are interesting, there were in each case some elements missing which are necessary for perfect reliability, and consequently the tests cannot be taken as proving the important points absolutely.

The automatic devices for cutting off the current proposed by Mr. Brown were not exhibited except incidentally.

Very respectfully,

S. S. WHEELER, Electrical Expert to the Board.

The following reports of Electrical Expert Wheeler were read:

REPORT OF ELECTRICAL EXPERT OF THE BOARD OF ELECTRICAL
CONTROL.

Detail of all Notices of Violations of Rules and Regulations sent from June 14 to
August 24, 1888.

Name of Company and Nature of Violation.	No. of Violations.	Notices sent.	Second Notice.	Notice Answered.	Notice Attended to.	Notice sent to Bureau of Incumbrances.	Notices Referred to Board.
U. S. Illuminating Co.							
Dead Poles	113	38	10	2	..	4	..
Dead Wires	283	173	52	29	20	46	..
Useless Fixtures and Wires ...	28	26	11	6	..	1	2
Lamps Low	28	26	11	2	2	..	1
Wires not Insulated	60	53	2	17	25	..	..
Dangerous Poles	1	1	..	..	..	..	..
Total	513	317	86	56	47	51	3
Brush Electric Lighting Co.							
Dead Poles	42	14	2	1	4	4	..
Dead Wires	34	27	3	16	11	3	..
Wires not Insulated	30	29	10	6	12	..	..
Dangerous Circuits	3	3	..	3	3	..	..
Slack Wires	1	1	..	..	..	..	..
Total	110	74	15	26	29	7	..
Metropolitan Teleph. & Teleg. Co.							
Dead Wires	60	41	5	19	27	..	..
Dangerous Poles	1	1	..	..	..	..	..
Total	61	42	5	19	27	..	..
Fire Department.							
Dead Wires	43	23	2	..	..	..	..
Dead Poles	2	2	..	..	..	..	..
Dangerous Poles	2	2	..	..	..	..	..
Other Violations	2	2	..	..	..	..	..
Total	49	29	2	..	..	..	..
Western Union Telegraph Co.							
Dead Wires	69	41	3	2	13	2	..
Dead Poles	6	5	..	..	1	..	..
Slack Wires	1	1	..	..	..	..	..
Total	76	47	3	2	14	2	..
Mount Morris Electric Light Co.							
Lamps Low	8	8	..	8	..	1	8
Total	8	8	..	8	..	1	8
East River Electric Light Co.							
Dead Wires	13	11	..	..	..	..	..
Lamps Low	2	2	..	..	..	..	..
Total	15	13	..	..	..	..	..

Name of Company and Nature of Violation.	No. of Violations.	Notices sent	Second Notice.	Notice Answered	Notice Attended to.	Notice sent to Bureau of Incumbrances.	Notices Referred to Board
Daft Motor Power Co.							
Dangerous Circuit.....	1	1	..	..	..	..	..
Other Violation.....	1	1	..	..	..	..	..
Total.....	2	2	..	..	..	..	..
Postal Telegraph Co.							
Dead Wires.....	3	..	..	..	..	..	..
Dangerous Poles.....	1	1	..	..	1	..	..
Total.....	4	1	..	..	1	..	..
American Dist. Telegraph Co.							
Dead Wires.....	14	8	I	..	2	..	..
Dangerous Circuits.....	2	2	..	..	..	..	..
Total.....	16	10	I	..	2	..	..
Police Department.							
Dead Wires.....	15	4	..	..	..	..	..
Dead Poles.....	8	2	..	..	..	..	..
Total.....	23	6	..	..	..	..	..
Grand Total.....	867	548	112	111	121	61	11
Notices sent to Companies, as above.....							548
Notices sent to Bureau of Incumbrances, as above.....							61
Notices sent to Bureau of Incumbrances of Poles, and Wires for which no owners could be found.....							131
							740

REPORT OF ELECTRICAL EXPERT.

Detail of all Notices of Violations of Rules and Regulations sent from August 24th to September 10th, 1888.

	No. of Violations.	No. of Notices sent.	No. of Second Notices sent.	No. of Answers Received.	No. of Notices Attended to.	No. of Notices sent to Bu of In.	No. of Notices R. to B.
U. S. Co.							
Dead Wires.....	5	4	..	..	..	..	..
Dead Poles.....	18	9	..	..	..	..	..
Total.....	23	13	..	..	..	..	..
Brush Co.							
Dead Wires.....	4	4	..	..	..	..	..
Useless Fixtures.....	1	1	..	..	..	..	..
Dangerous Circuits.....	1	1	..	..	..	..	..
Total.....	6	6	..	..	..	..	..

	No. of Violations.	No. of Notices sent.	No. of Second Notices sent.	No. of Answers Received.	No. of Notices Attended to.	No. of Notices sent to Bu. of In.	No. of Notices R. to B.
Harlem E. L. Co.							
Dead Wires.....	1	1	..	1	..	..	..
Mt. Morris Co.							
Dead Wires	1	1	..	..	..	..	..
East River E. L. Co.							
Dead Wires.....	1	1	..	..	..	..	..
Fire Department.							
Dead Wires.....	12	11	..	..	..	..	..
Slack Wire	1	1	..	..	..	..	..
Dangerous Wires	1	1	..	..	..	..	..
Total	14	13	..	..	..	..	..
W. U. Tel. Co.							
Dead Wires.....	18	14	..	..	..	..	..
Dead Poles.....	2	2	..	..	..	..	..
Dangerous Poles.....	4	4	..	..	..	..	..
Total.....	24	20	..	..	..	..	..
Met Tel. & Tel. Co.							
Dead Wires.....	36	19	..	3	..	..	..
American Rapid.							
Dead Wires.....	6	4	..	..	..	..	..
Poles Unmarked.....	1	1	..	..	..	..	..
Total	7	5	..	..	..	..	..
American N. T. Co.							
Dead Wires.....	2	2	..	..	..	..	..
Gold & Stock.							
Dead Wires.....	1	1	..	..	..	..	..
Erie R. R.							
Dead Wires.....	2	2	..	..	..	..	..
No Owner.							
Dead Wires.....	14	12	..	..	..	12	..
Dead Poles.....	94	10	..	..	..	10	..
Dangerous Poles.....	2	2	..	..	..	2	..
Total	110	24	..	..	..	24	..
Grand Total	228	108	..	4	..	24	..

Notices sent to the Bureau of Incumbrances of Dead Poles and Dead Wires from June 14th to September 10th:

Dead Poles	64
Dead Wires.....	160
Total	224
Poles Removed to date of Report by Bureau of Incumbrances..	109

Commissioner Gibbens offered the following resolutions:

Resolved, That the Electrical Expert be authorized and directed to bring in, at the next meeting of the Board, a revision of the Rules and Regulations, as far as they relate to electric light poles, wires and fixtures, and that that report shall express his views as to the proper construction of electric light plants overhead where there are no subways, a rule specifying the mode in which the poles and lines shall be constructed, the size of poles, and all matters pertaining to the construction of electric light wires.

Unanimously adopted.

Resolved, That the permits for the erection of poles heretofore granted to electric light companies, and not acted on, be revoked, that the companies be notified, and that the Commissioner of Public Works also be notified that there are at present no permits extant to electric light companies to erect poles in the city of New York, and will not be until he is further notified.

Adopted. Vote—Commissioners Gibbens and Moss "aye"; President Hess "no."

Commissioner Gibbens—Some time ago the Board appointed me a committee to take litigation against the United States Illuminating Company for violation of rules and regulations and requests of this Board, and as result three or four suits were begun in police courts, and a petition was made to the Attorney General. I have to report that the petition to the Attorney General failed to be productive of any beneficial result as far as the Board is concerned. I have received from the Attorney General his opinion adverse to the petition, which I ask to be filed among the other papers of the Board. The committee was successful in having the United States Illuminating Company held to await the action of the Grand Jury in one of the cases which was brought, and inasmuch as further proceedings against this Company for violation of law can and ought to be begun by the District Attorney of the county. I ask that your committee be discharged.

President Hess—There being no objection, the report will be received and spread on the minutes, and the committee discharged.

President Hess offered the following resolution:

Resolved, That the Secretary be directed to write a letter to the District Attorney and respectfully call his attention to the action of Police Justice Gorman in the case of *The People ex rel. Schuyler S. Wheeler* against *The United States Illuminating Company*, and ask him to take prompt action in the matter.

Unanimously adopted.

Commissioner Gibbens stated that some time since the Board addressed a letter to the Consolidated Telegraph and Electrical Subway Company, calling its attention

to the fact that its subway on Park Row was untenable owing to the encroachments upon it by the Steam Heating Company, and offered the following resolution:

Resolved, That the Secretary be directed to remind the Consolidated Telegraph and Electrical Subway Company that it is its duty to repair the subway on Park Row, or render it tenable by electric companies, and that the Board expects that it will take action immediately in the matter.

President Hess called on Engineer Beckwith of the Consolidated Telegraph and Electrical Subway Company for a statement in regard to the matter of the resolution offered by Commissioner Gibbens, and Engineer Beckwith said that the Steam Heating Company had made some repairs, but there was still cause for complaint against that Company.

Resolution of Commissioner Gibbens unanimously adopted.

Commissioner Gibbens moved the following resolution:

Resolved, That the Secretary be directed to provide the Board with suitable offices. Unanimously adopted.

President Hess offered the following resolution:

Resolved, That the application of James G. McMurray to erect a pole on the northeast corner of Broadway and 34th Street be granted.

Adopted. Vote—Commissioners Hess and Gibbens "aye"; Commissioner Moss "no."

The following communication was read:

CITIZENS' ASSOCIATION OF BOSTON,

10 TREMONT BANK BUILDING,

No. 8 CONGRESS STREET,

BOSTON, Sept. 14, 1888.

THEODORE MOSS, Esq., Secretary of the Board of Electrical Control for the City of New York, No. 1218 Broadway, New York:

DEAR SIR:—Will you be kind enough to inform me whether the Board of Electrical Control has any rules governing the time in which underground conduits must be laid? That is to say, whether they can be laid either in the day-time or in night-time, or whether there is a rule which compels them to be laid at night so that the street may be kept clear for the ordinary day traffic? And will you also inform me if in addition to any such rule, if any, there is any ordinance or law of the State or city that requires such work to be done in the night-time?

At the present time we are greatly disturbed in this city by having many of our principal-streets torn up and blockaded in the day-time, and I wish to know whether other cities suffer as we do, or whether they are better protected by ordinances or rules.

Very truly yours,

H. L. HARDING, Secretary.

President Hess offered the following resolution:

Resolved, That the communication of H. L. Harding, Secretary of the Citizens' Association of Boston, dated September 14th, 1888, be referred to the Engineer.

Unanimously adopted.

The following report of Engineer Kearny was read:

REPORT OF HENRY S. KEARNY, CHIEF ENGINEER BOARD OF ELECTRICAL CONTROL.

NEW YORK, August 11th, 1888.

I beg leave to report that the electrical subways constructed during the present year, up to August 1st, are as follows:

For.	Length of Trench.	Length of Single Duct.
Telephone and Telegraph.....	28,821	523,796
Electric Light.....	3,450	37,507
Edison Subway Trench, "Special".....	1,963	7,748
Total	34,234 feet 6.48 miles	566,051 feet 107.20 miles

The total number of manholes built in 1888 is 146.

The construction of the above work may be subdivided as follows:

	Length of Single Duct in feet.
Iron Pipe laid in Hydraulic cement concrete.....	323,461
Iron Pipe laid in Asphaltic concrete.....	79,880
Creosoted Wooden Tubes.....	95,946
Cement Pipe laid in Hydraulic cement concrete.....	59,016
Edison Iron Tubes.....	7,748
Total	566,051

The balance of the work authorized by the Board of Electrical Control in 1887, but left unfinished in 1887 is 626,235 feet.

The new work authorized by the Board of Electrical Control in 1888 is 764,895 feet. This makes a total length of 1,391,130 feet of single duct authorized to be built, after deducting 566,051 built in 1888, up to August 1st, this leaves still 725,079 feet, or 137.32 miles to be built.

The total length of subways constructed is:

	Length of Trench.	Length Single Duct.	Manholes.
In 1886	1.88 miles	44.66 miles	42
" 1887	25.41 "	268.11 "	279
" 1888 (to Aug. 1st).....	6.48 "	107.20 "	146
Total	33.77 miles	419.97 miles	487

The 268.11 miles of single ducts built in 1887 were constructed in 5 months. The season of 1888 commencing a couple of months earlier will cover about 7 months.

The work authorized and partly built, as previously stated, amounts to 244.53 miles.

HENRY S. KEARNY, Chief Engineer.

Commissioner Gibbens offered the following resolution:

Resolved, That the Report of Engineer Kearny be spread on the minutes.

Unanimously adopted.

Commissioner Gibbens stated that the Board had before it a number of letters of the United States Illuminating Company, addressed to John Richardson, Superintendent of the Bureau of Incumbrances, protesting against the removal of its poles and wires. The tenor of these letters is that these poles and wires, which are reported to be "dead" are not "dead," but are alive and are necessary to the business of the Company. The Commissioner thereupon offered the following resolution:

Resolved, That the letters of the United States Illuminating Company, addressed to John Richardson, Superintendent of the Bureau of Incumbrances, be returned to the Commissioner of Public Works, and that he be informed that he is referred to the letter sent to him on August 13th, 1888, wherein it is stated that all poles and wires reported as "dead" are first, either not actually in use, or, second, not necessary to the business of the Company; that the Commissioner be advised that this Board is very careful to report to him only such as come within this distinction; that all the poles and wires complained of which have been removed are known by the Board to have been "dead" poles and wires under this distinction; and that the Board will continue to send notices of poles and wires found to be "dead," from time to time, in the expectation that they will be removed as these have already been; that the Board is gratified with the expeditious removal of poles now going on, and hopes that it will be continued, and that the "dead" wires will also be reached and removed.

Unanimously adopted.

The following communication and Report of Inspector Fitzpatrick were read:

NEW YORK, Sept. 4, 1888.

THEODORE MOSS, ESQ., Secretary Board of Electrical Control:

SIR:—Upon a letter received from Mr. Daniel Connolly, of No. 28 Union Square, in reference to unused electric light poles in Morris street, between Washington and West streets, the Supt. of Incumbrances reports that there are three electric light poles in that block on the south side of the street, on which two telegraph wires are suspended, and two electric light poles on the north side of the street, on which five wires are suspended. He states that he is unable to determine whether or not these poles and wires are in use, and I respectfully request report from your Board on that question, and whether the poles and wires are subject to removal by this Department.

Very respectfully,

D. LOWBER SMITH, Deputy and Acting Commissioner of Public Works.

U. S. Co.

There are six dead poles extending from Broadway to West street. There is a useless loop on pole corner of Broadway and Morris street, and these poles have a dead telegraph wire running on these poles. The Fire Department has a line of live poles on north side of Morris street with wires on them that are in circuit.

INSPECTOR F. J. FITZPATRICK.

Commissioner Gibbens offered the following resolution:

Resolved, That the letter of D. Lowber Smith, Deputy and Acting Commissioner of Public Works, dated September 4th, 1888, be answered by the Secretary, to the effect that the poles are "dead," and that the Secretary request that the poles be removed, and enclose with the communication the report of the Inspector.

Unanimously adopted.

The following communication was read:

NEW YORK, August 17th, 1888.

SUPREME COURT.

THE MAYOR, ALDERMEN AND COMMONALTY

OF THE CITY OF NEW YORK,

AGAINST

THE UNITED STATES ILLUMINATING

COMPANY.

To the Board of Electrical Control:

GENTLEMEN:—I desire to inform you that the motion for an injunction in the above entitled action was noticed for Monday, the 20th instant, and has been set down

for Thursday the 23d, when it will in all probability be brought on for a hearing. I enclose herewith a copy of the papers together with a notice of motion, and remain,

Yours respectfully,

HENRY R. BEEKMAN, Counsel to the Corporation.

Commissioner Gibbens offered the following resolution:

Resolved, That the letter of the Corporation Counsel in reference to the suit against the United States Illuminating Company be spread on the minutes and the papers referred to therein be filed.

Unanimously adopted.

The following communication was read:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,

NO. 18 CORTLANDT STREET,

NEW YORK, N. Y., September 18, '88.

To the Honorable, the Commissioners of the Board of Electrical Control, HON. JACOB HESS, President, No. 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith submit for the consideration of your honorable Board the subway lines mentioned below, for which we respectfully ask your approval and authorization:

1. A crossing of Broadway at 43d street and a crossing of Madison avenue at 41st street, to meet the requirements of the Edison Electric Illuminating Company, construction Edison iron tubes.

2. A telephone and telegraph subway along Madison Square on the north side of 23d street from Madison avenue to Broadway, connecting the subways of the same description already built on the latter streets. This connection is rendered necessary at this time to meet the requirements of the Metropolitan Telephone & Telegraph Company. This work is to be built of wrought iron pipe laid in hydraulic cement concrete, which is the construction adopted for the lines which it connects.

3. An electric light subway on the north side of 125th street, extending from the east side of 2d avenue to the west side of 8th avenue, for the accommodation of the electric light companies in the adjoining district. This line to consist of "Johnstone" cast iron conduit providing the trunk line accommodations and the necessary distributing facilities.

We enclose herewith maps showing the above lines.

Very respectfully,

EDWARD LAUTERBACH, President.

Commissioner Gibbens offered the following resolution:

Resolved, That the construction outlined by the letter of the Consolidated Telegraph and Electrical Subway Company, dated September 18th, 1888, be authorized.

and that that Company be directed to construct subways in accordance with the plans as rapidly as possible under the direction of the Board's Engineer.

Unanimously adopted.

The following communication was read:

OFFICE OF THE GENERAL MANAGER OF
THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.,
18 CORTLANDT STREET,
NEW YORK, August 23d, 1888.

To the Honorable the Board of Electrical Control, 1218 Broadway:

GENTLEMEN:—Permission is respectfully requested from your Honorable Board, on behalf of this Company, for the privilege to erect a new pole line on the east side of the City from New Chambers street and Park Row north to the corporation line for increased facilities for Long Distance lines into the New England States.

To insure anything like perfect service it will be necessary to carry these lines independent of cables as far as possible, for the reason that the retarding effect from aerial and underground cables is so great that the service is greatly impaired.

The proposed route of this line, should the privilege be granted, can be furnished as soon as required.

Very respectfully,

W. H. ECKERT, Genl. Mgr.

Commissioner Gibbens offered the following resolution:

Resolved, That the communication of the Metropolitan Telephone and Telegraph Company, dated August 23d, 1888, asking permission to erect a new pole line, be referred to the Engineer, with a view of his having a consultation with W. H. Eckert, its General Manager, as to what the Company will do in the way of taking down poles in consideration of obtaining this permission.

Unanimously adopted.

Commissioner Gibbens stated that the Harlem Lighting Company, sends a letter in answer to communications of the Board relating to the placing of a pole in front of premises without the permission of the property-owner; and he offered the following resolution:

Resolved, That the letter sent by the Harlem Lighting Company, dated September 5th, 1888, answering communications of this Board concerning a pole of that Company placed at the southeast corner of 122d street and Third avenue, without permission of the property-owner, be referred to the property-owner.

Unanimously adopted.

The following communication was read:

ALDRICH COURT, 45 BROADWAY,
NEW YORK, September 18th, 1888.

S. S. WHEELER, ESQ., Board of Electrical Control, New York:

DEAR SIR:—Herewith please find sample of cable we propose to furnish the East River Electric Light Company, for the purpose of laying in subway conduits, and we would be glad to have your written approval of same at your earliest convenience.

The cable is made of a stranded conductor insulated with our own preparation called "bittite" and is then perfected by three strong waterproof tapes and one outside braid, making the whole a very strong and substantial cable, well able to stand a considerable amount of abrasion besides its possessing very high insulating properties. Awaiting your answer, we are,

Yours truly,

THE CALLENDER INSULATING AND WATERPROOFING CO.,
A. C. SHAW.

Commissioner Gibbens offered the following resolution:

Resolved, That the communication of the Callender Insulating and Waterproofing Company, dated September 18th, 1888, be referred to the Electrical Expert, and he be directed to reply that after the cable is placed in the subway he will make a test on behalf of the Board and see whether it comes up to the requirements.

Unanimously adopted.

Resolved, That the application of the Hall Telephone Company to run a private wire over housetops from 9 West 13th street to 142 West 18th street be laid on the table.

Unanimously adopted.

The following communication, on motion of Commissioner Gibbens, was ordered to be spread on the minutes:

NEW YORK, August 29, 1888.

THEODORE MOSS, ESQ., Secretary Board of Electrical Control:

SIR:—In answer to your letter of 1st inst., in reference to the notice of a dead telegraph pole at the S. W. corner of 39th street and 6th avenue, and stating that some hundred odd other notices of other dead poles and wires had been transmitted to this Department, I beg to say that the pole at 6th avenue and 39th street has been removed, and that the removal of other poles and wires, reported by your Board, is actively progressing.

Very respectfully,

D. LOWBER SMITH, Deputy and Acting Commissioner of Public Works.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Wednesday, October 17th, 1888, at 2 o'clock, P. M.

Present: Commissioner Jacob Hess, President; Commissioner Daniel L. Gibbens, Commissioner Theodore Moss.

On motion of Commissioner Gibbens, the reading of the minutes of the last meeting was dispensed with.

The following communication was read:

EXECUTIVE OFFICES OF
THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.,
18 CORTLANDT STREET,
New York, Oct. 15th, 1888.

To the Honorable, the Board of Electrical Control:

GENTLEMEN:—In conformity with your request I beg to report the progress made by this Company in removing its poles and wires.

The wires of this Company on 58th street between Fourth and Sixth avenues have been removed and if the Fire Department have removed their wires the poles can be taken down.

Our poles on First avenue between 58th street and 106th street will be ready for removal by November 15th, and we are further endeavoring to continue the removal of the First Avenue line as far south as 39th street, thence through 39th street to Second avenue, and on the west side of Second avenue to 32d street, which I have no doubt we shall be able to do within sixty days.

We are also endeavoring to get the wires off the poles on the south side of 23d street between Broadway and Sixth avenue. We have 27 working wires on this line.

Referring to our pole line on Seventh avenue from 14th street to 58th street:—Starting from 14th street on the east side the Western Union Telegraph Co. have a pole line directly under our line. Both these lines cross from the east to the west side of the avenue at 32d street, and the Western Union line branches off at 47th street and Broadway. If the Western Union Telegraph Company would join us in the construction of a new line, to take the place of the two existing lines I should be glad to recommend the same.

The pole line on Sixth avenue between 4th street and 21st street we will remove as soon as the cables can be drawn into the ducts, which I think can be done in ninety days and possibly sooner.

It is our intention, so far as is practicable, to concentrate our wires on the east side of the City north of 58th street so as to lessen the number of parallel lines and thus abandon one of the lines north from 58th street, but which line it will be we are unable at this time to determine.

Very respectfully,

W. H. ECKERT, General Manager.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to communicate with W. C. Humstone, Superintendent of the Western Union Telegraph Company, and request on behalf of the Board that the proposition made by the Metropolitan Telephone and Telegraph Company in their communication, dated October 15th, 1888, be accepted, and that that single line of poles be placed on Seventh avenue from 14th street to 47th street instead of the two lines which are there at present.

Unanimously adopted.

Commissioner Gibbens stated that there was a report before the Board from the committee which was appointed in regard to the electric light construction, and that the report was in the shape of a letter—which had been addressed to the electric light companies—and some rules and regulations which have been drafted by the Expert. The letter and rules, which were read, are as follows:

NEW YORK, October 1st, 1888.

To the President of the

Company:

SIR:—The possibility of placing electric light conductors under ground during the present season is confined to a comparatively small area of the city where subways have been constructed, and the opposition met with on the part of corporations engaged in the electric lighting business to the burial of their wires, together with the lack of co-operation on the part of certain officials, render it improbable that a much greater area will be provided with subways in the near future.

The condition of the electric light wires overhead in the city at present is extremely hazardous to life and property, and necessitates a radical departure in the direction of safer and better construction.

A reputable and public spirited citizen, who believes that the use of high tension currents should be wholly prohibited, has compiled a list of the casualties which have occurred in this city owing to the improper construction of electric light routes within the past two years, as follows:

"December, 1886, Joseph Stamans was killed by a Brush Electric Light wire.

"May 6, 1887, J. T. Simpson, Engineer, Adams Express Co., 59 Broadway, was instantly killed by a Thompson-Houston electric light wire.

"October 24, 1887, George Schneider was killed at station of the Harlem Electric Light Co.

"About the same time a waiter in the Atlantic Beer Garden was killed by an arc lamp circuit.

"At a fire in Fulton street, Lineman Simons cut an electric light wire and was killed.

"December 11, 1887, Ambrose Hilbert touched a straggling telegraph wire which was hanging across an electric light wire and was killed.

"April 15, 1888, Anton Streiffer, a peddler, ran into a telephone wire which was in contact with a Brush arc circuit in East Broadway and was instantly killed.

"April 28, 1888, Fred. Witte, a salesman, 200 Bowery, touched an arc lamp hanging within reaching distance over an iron grating in front of the show window and was killed.

"May 12, 1888, Thomas H. Murray, an expert, made a ground connection while touching a Brush circuit and was killed.

"July 16, 1888, William Meir was killed at Adams Express Co., 59 Broadway, by contact with electric light wire.

"August 12, 1888, Nelson Richardson, a laborer living near Carmansville, was killed by touching an electric light wire.

"Within the same period quite a number of persons, perhaps as many as those above enumerated, have been killed by high tension circuits in Brooklyn, Hoboken and Jersey City, and it is only fair to assume that an equal ratio of fatalities has prevailed in other cities throughout the Union."

The Rules and Regulations of the Board of Electrical Control are not complied with, and many serious consequences are to be apprehended where violations exist. The Board has for a short time been collecting evidence of neglect and violation of its Rules and Regulations, and finds so many cases of improper insulation, faulty construction, unnecessary obstruction of the street and unsightly appearance of pole lines that it may safely be said a compliance with the few simple rules and regulations of the Board already adopted would require a complete renewal and reconstruction.

The reluctance of the Board of Electrical Control to permit the further multiplication of the overhead pole lines throughout the city and the difficulty and danger attending the burdening of the lines already existing with a greater number of wires than they now bear, are serious obstacles to the extension of the business of electric light companies, and prevent the affording of opportunities for concerns such as yours to supply light to bona fide customers.

On many streets in the city more than one line of electric light poles already exist, and in some cases as many as two or three companies have pole routes along the same street. For the amelioration of the condition of affairs as it exists as above stated, and in order, if it be possible, to enable electric lighting companies to carry on and extend their business without the unnecessary duplication and multiplication of pole lines, and in order that the Rules and Regulations of the Board of Electrical Control sanctioned by the Legislature and formulated with a view to the protection not only of the lives and property of citizens but also of the workmen employed by your companies, and in your interest as well, the Board of Electrical Control has appointed a committee to formulate a general plan for the reconstruction of the electric light lines throughout the city, so as to afford the utmost facility for the carrying on of your business, while at the same time insuring the safety of the public and a minimum amount of obstruction in the highways and, by the promotion of competition free to all duly authorized corporations, the best and cheapest illuminating service to the public.

The committee appointed, as has been said, have determined to report at the next meeting of the Board certain rules and regulations for the construction of electric light plant in the city recommended by Mr. Wheeler, the Expert of the Board,

and to suggest to the Board that it grant permission to any companies desiring it to erect poles and string wires in any of the streets of the city, except where subways have been or are about to be provided, in accordance with these rules and regulations, under the following general conditions:

First. The company must be a duly authorized company for the purpose of supplying electric light or power.

Second. The company must agree to abide by the rules and regulations of the Board and to make its entire system of overhead conductors comply therewith in every respect.

Third. The company must agree to allow any and all other companies to use the said lines of poles constructed under this permit upon payment of a sum to be agreed upon by the companies, and not exceeding half the cost of the said poles to the said company erecting the same. In case of any disagreement between the companies the Board shall be the sole and final arbiter of the amount to be paid for the use of these pole lines.

Fourth. The company must agree unconditionally to place its conductors in the subways where provided as rapidly as possible.

Fifth. No permits shall be granted for the erection of pole lines on streets where subways have been prepared.

Sixth. In all streets where lines of poles for electric lighting exist at present, companies owning the same shall agree to remove these existing poles and wires and make use of a new construction conforming in every respect to the Rules and Regulations of the Board whenever the same shall be completed either by a new company or the one already having a pole line upon the said street.

Seventh. The Board will not consider any request for permits for overhead construction, repairs or alterations made by any company violating any of these agreements.

Eighth. After a reasonable time has elapsed from the adoption of these Rules and Regulations any company whose lines of overhead conductors do not conform therewith shall be deemed to be in contempt before the Board and not entitled to further privileges or permits.

Ninth. All permits granted by the Board for the construction, alteration or repair of overhead systems shall be understood to be valid only pending the preparation of underground accommodations in the locality.

Upon these conditions, and in accordance with these Rules and Regulations, the committee will recommend that the Board grant all permits which may be desired by your company or any other company willing to comply therewith.

It is the opinion of the Board, as well as of the committee, that under proper regulations the use of electric conductors for high tension currents can be made reasonably safe, and the inconvenience, danger and unsightly appearance done away with. It is believed by the committee that the welfare of the electric lighting companies demands that you co-operate with the Board in this undertaking, and that by refusing privileges to companies which do not comply with its Rules and Regulations the Board can eventually compel such a compliance.

The service as it exists to-day, as has already been said, is absolutely unsafe, unsightly, a detriment to the welfare of the companies themselves, disgraceful to the city and to those who have constructed it and wholly intolerable. The committee will recommend that the Board condemn it in toto, with this reservation only, that if the electric lighting companies will co-operate with the Board in its endeavor to reform this great and crying evil they shall be allowed the necessary time and opportunity to effect the reform without interfering with their business.

It may be that companies will be allowed to neglect these Rules and Regulations for a period in the future, as they have in the past, but the time will come when they will be brought to with a round turn, and when the people of the State and city will no longer tolerate further departure from proper methods in the conduct of their business. At all events, it will be the part of the Board of Electrical Control to do what it can towards the very desirable result.

The rules and regulations proposed are appended, and at the meeting of the Board when the same are reported for consideration it will be proper for you to make such suggestions in regard to the entire matter as may seem for the interests of your company and the public.

Very respectfully,

THEODORE MOSS, Secretary.

OFFICE OF THE BOARD OF ELECTRICAL CONTROL,

1218 BROADWAY, N. Y.

RULES AND REGULATIONS FOR OVERHEAD CONDUCTORS FOR ELECTRIC LIGHT AND POWER.

I. No two lines of poles bearing conductors of a like class shall be erected on any street or avenue.

II. No two lines of poles shall be erected on the same side of any street or avenue.

III. Poles shall be set in the sidewalk, at the curb, and no pole shall be placed within ten feet of any lamp-post or other pole.

IV. All poles now standing, or to be hereafter erected, shall be branded or stamped with the initials of the company owning them, at a point not less than five nor more than seven feet from the street surface; and when a pole is occupied by wires belonging to more than one company, each group of cross-arms, or where necessary the support of a single wire of different ownership, must be distinguished by some characteristic mark or fastening.

V. Electric light lamp-posts shall be in accordance with the plan adopted by the Board.

VI. All poles erected for the purpose of carrying lines of electric light or power wires shall be at least forty-five feet high, uniform in size, straight, and painted from top to bottom—a very dark color from the sidewalk to a point eight feet high, and a dark green color above that.

VII. Cross-arms shall be uniform in length, strengthened by braces, and painted as well as the poles, a characteristic color being used by each company.

VIII. Each line of poles must be run on one side of the street only, except when absolutely necessary to change to the other side; but this may only be done by the permission of the Board or its representative.

IX. Electric light conductors must not be placed upon fixtures erected or maintained for supporting wires of the other class, namely those for signalling, except by permission of the Board.

X. Poles shall be uniformly spaced, and about sixty to the mile. This requires on the short city blocks of two hundred and sixty feet, alternately three and two poles to the block.

XI. All conductors shall be secured to insulating fastenings, and covered with an insulation which is water-proof on the outside and not easily worn by abrasion. Whenever the insulation becomes impaired it must be renewed immediately.

XII. No wire shall be stretched within eight inches of any pole, building or other object, without being attached to it and insulated therefrom.

XIII. All circuits which ever carry a current exceeding 500 volts, between 9 A. M. and 4 P. M., must be painted for a length of two feet at each insulator.

XIV. Every wire must be distinguished by a number plainly marked on each cross-arm under the insulator.

XV. No unused loops from electric light circuits shall be allowed to remain after lamps are taken away, except in cases where it is positively known that the lamp will be required again within three months, and where there is no underground conduit for that class of circuits.

XVI. All arc lamps must be so placed as to leave a space underneath of nine (9) feet clear between lamp and sidewalk when out of doors, and eight (8) feet clear between lamp and floor when in-doors.

XVII. All wires must be stretched tightly and fastened to glass insulators with a strap of the same kind of wire.

XVIII. All connections with lines of electric light conductors shall be made at right angles to the same; and connections to buildings shall be run straight across to the building, and then down the front of the building.

XIX. All joints must be as well insulated as the conductors, and the insulation of joints must be maintained.

XX. Every line entering a building shall be controlled by a cut-out placed near the entrance in sight, and easily accessible.

XXI. No wires shall hang within twenty-five feet of the pavement at the lowest point of sag between supports.

XXII. In the construction of lines the insulation to be used must be approved by the Expert of the Board in writing, and the insulation resistance must be maintained in accordance with a standard to be not less than ohms per mile per hundred volts. And under no circumstances shall Underwriters' wire be used.

XXIII. All circuits must be tested every hour, and when a ground comes on, effort must be made to remove it at once; failing in this, the current must be discontinued until the insulation is restored.

XXIV. The insulation must be preserved throughout the entire circuit, and if any portion of a lamp or fixture is a part of the circuit and can be touched, it must be insulated.

XXV. All conductors shall have a resistance uniformly distributed, of not more than 1-10 ohm. per mile per ampere, and proportionately less for heavier currents.

XXVI. All existing regulations of the local authorities in regard to the placing of poles and stringing of wires are to continue in force, except when in conflict with the rules, and the rules and regulations of the New York Board of Fire Underwriters must be strictly observed.

XXVII. The violation of any of the rules and regulations of the Board shall operate ipso facto by a revocation of the permit held by the company or person guilty of such violation.

XXVIII. Whenever hereafter any company shall be permitted by this Board, or its successors, to erect posts or poles, or other fixtures bearing lamps or other devices, for the purpose of lighting by electricity the streets, avenues, highways, parks or public places of the city, the said permission shall be granted only subject to the following provisions, and the same is hereby expressly made a condition of said permits. At any time when, by action of the city authorities, the contract for lighting any such street or other public place shall be given to another company, the company erecting said lighting fixtures or lamp-posts shall, on tender of the first cost thereof, yield possession and ownership of the same to the said other company obtaining the new contract.

XXIX. All broken and "dead" wires, and all wires, poles and fixtures not actually in use, must be removed from the streets, avenues and highways of the city. When an old pole is taken down it must be removed from the street the same day. New poles must not be brought upon any street more than two days in advance of their erection. Any pole that shall lie on any street more than two days shall be removed by the Bureau of Incumbrances of the Department of Public Works, at the expense of the party owning it.

XXX. From and after the first of August, 1888, no company shall do business of arc electric lighting in the City of New York without a Certificate of the Board, granted on the recommendation and after inspection by the Expert of the Board, to the effect that its lines comply with all the Rules and Regulations of the Board, and that its plant is in proper condition for the doing of its business. The force of the Certificate to continue until changes are made, of which the Board must be notified and approve, or so long as the plant and conductors remain in the same condition as when inspected.

XXXI. Every lineman must wear a badge in a conspicuous place, giving his number and the name of the company by whom he is employed.

XXXII. All permits of the Board for overhead wires and fixtures are granted only pending the providing of underground accommodations in the neighborhood of the street or avenue for which the permit is granted.

XXXIII. Any member or officer of the Board, and every inspector employed by it, as well as every member of the police force of the city, shall be entitled to examine permits under which work of any kind is being done.

XXXIV. No permit shall be granted for the erection of any overhead structure nor for the renewing of any lines already existing in any street, avenue or highway in which underground accommodations for the service have been provided, or are being provided.

XXXV. Every line, pole, fixture, etc., must be kept in thorough order, repair, and conformity with these rules and specifications, upon penalty of forfeiture of all permits granted to the owner.

But the general permit under which these repairs are to be made does not cover the erection in any street, avenue or highway of any new poles or other similar fixtures, and has absolutely no reference whatever to lines which have been ordered underground by the Board, and which the Mayor has been requested to remove.

In the case of such lines, where notice has been given that underground accommodations have been provided, and the ninety days of notice required by law have elapsed, and the Mayor has been requested to remove the same, companies owning or operating said lines are not authorized to make any repairs or connections or to go upon the poles bearing such lines for any purpose whatever, except to remove the said lines of electrical conductors in conformity with the directions of the Board.

Any deviation from this rule requires a resolution passed at a regular meeting of the Board, attested by the Secretary.

XXXVI. The companies or persons owning or controlling poles in any street or avenue shall allow the same to be used by other companies or persons operating conductors for similar electrical service when authorized so to do by the Board, on tender of proper compensation, to be determined by agreement between the parties interested. In default of such an agreement the amount of such compensation shall be determined by the Board. This rule imports a contract on the part of each company or person owning or controlling the poles on any street or avenue, not only with the Board, but also with each company or person who shall under its terms be qualified to demand the privileges it confers, to permit this joint use of poles.

And in accepting any permit the applicant thereby binds himself to this agreement.

Commissioner Gibbens offered the following resolution:

Resolved, That the committee on electric light construction be discharged, that the report of the committee be laid on the table, to be taken up at a meeting of the Board to be held for the purpose on Friday, October 19th, 1888, at 11 o'clock A. M., to which the attention of the electric light companies shall be called, and at which they be requested to be present.

Unanimously adopted.

The following communication was read:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,

NO. 18 CORTLANDT STREET.

NEW YORK, N. Y., October 17, 1888.

To the Honorable The Commissioners of the Board of Electrical Control, Hon. JACOB HESS, President, 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith submit for the approval and authorization of your honorable Board the following lines of electrical subways to be built during the present season, and request that you give the matter favorable consideration:

First. The extension of the telephone and telegraph subway on the west side of 8th Avenue from 45th to 28th Streets. To be built of wrought iron pipe laid in hydraulic cement concrete, which is the construction adopted on the original line of which this is a continuation.

Second. A telephone and telegraph subway on Barclay Street, from College Place to the North River. To be built with wrought iron pipe laid in hydraulic cement concrete.

Third. A telephone and telegraph subway on Chambers Street, from West Broadway to the North River. To be built of wrought iron pipe laid in hydraulic cement concrete.

Fourth. A telephone and telegraph subway on Spring Street, from Broadway to Chrystie Street. To be built of wrought iron pipe laid in hydraulic cement or asphaltic concrete.

All of the above are largely to meet the requirements of the Metropolitan Telephone and Telegraph Company.

Fifth. The Edison Electric Illuminating Company have applied for several crossings and short lines of subways, to connect the different portions of their uptown systems, to be built of their special tubing, as follows:

42d Street, south side, from 5th to Lexington Avenues.
41st Street, north side, from Madison to Lexington Avenue.
Park Avenue, both sides, from 38th Street to 42d Streets.
Crossing 42d Street, east side of 5th Avenue.
Crossing 5th Avenue at 50th Street.

The above is respectfully submitted to your honorable Board with the maps showing the various lines.

Very respectfully,

EDWARD LAUTERBACH, President.

Commissioner Gibbens—I would like to ask the Engineer if he has found these routes to be in accordance with the general plan of the Board.

Engineer Kearny—They were only submitted to me a few minutes ago.

Commissioner Gibbens offered the following resolution:

Resolved, That the routes specified in the communication of the Consolidated Telegraph and Electrical Subway Company, dated October 17th, 1888, be referred to the Engineer to report whether they are in accordance with the general plan of the Board.

Unanimously adopted.

The following communication was read:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,

NO. 18 CORTLANDT STREET.

NEW YORK, N. Y., October 17, 1888.

To the Honorable The Commissioners of the Board of Electrical Control, HON. JACOB HESS, President, 1218 Broadway, New York, N. Y.:

GENTLEMEN:—With regard to the resolution of your honorable Board, dated September 18th, 1888, namely:

"Resolved, That the Secretary be directed to remind the Consolidated Telegraph and Electrical Subway Company that it is its duty to repair the subway on Park Row, or render it tenantable by electric companies, and that the Board expects that it will take action immediately in the matter."

I beg leave to submit for your information the following reports of the Chief Engineer of this Company, which will place you in possession of the facts. The New York Steam Company has been called upon to make the necessary repairs and has given us the strongest assurance that they will comply with these demands. We are following the matter up closely and carefully as it is possible to do and believe that under these difficult circumstances we are entitled to the co-operation of the electric companies in providing the best protecting covering to the insulation of their cables against the underground influences which have to be encountered.

Very respectfully,

EDWARD LAUTERBACH, President.

NEW YORK, N. Y., October 5th, 1888.

MR. EDWARD LAUTERBACH, Pres't. Consolidated Telegraph and Electrical Subway Company, No. 18 Cortlandt Street, New York, N. Y.:

DEAR SIR:—I have duly received the copy of the following resolution of the Board of Electrical Control, dated September 18th, 1888, viz.:

"Resolved, That the Secretary be directed to remind the Consolidated Telegraph and Electrical Subway Company that it is its duty to repair the subway on Park Row, or render it tenantable by electric companies, and that the Board expects that it will take action immediately in the matter,"

And, as requested by the Executive Committee, beg leave to report the result of my examination in this matter at the point named in the resolution and elsewhere along Broadway where the heat has been noticed.

First. At the time the subway crossing was built at Park Row and Broadway, in order to provide as much as possible against the danger of heat from radiation or from leaks of the mains of the New York Steam Heating Company, the subway crossing, which was approximately at right angles to the steam mains, was made to pass $1\frac{1}{2}$ feet beneath the brick conduit containing them, instead of over them. It was believed, and I have seen no reason to change this opinion, that the thickness of three inches of concrete above the iron ducts, two inches of creosoted planking and a thickness of 15 inches of earth above, would be effective as against any radiation, taking into consideration that the steam mains are surrounded by mineral wool and placed inside of a brick conduit. The heat which has subsequently been proved to exist in the duct clearly arises from leaks in the steam mains and not from radiation. This particular question has been fully examined and discussed in my previous report. Upon the complaints of the users of the ducts at this crossing, the temperature has been tested at various times, as shown in detail in the annexed table, viz.:

TABLE A.

PARK ROW CROSSING BROADWAY.

	June 27.	June 29.	June 30.	July 18.	July 28.	Aug. 18.	Sept. 21.	Oct. 2
					135			
Temp. in Ann St. M. H.	178	...	...	130	168	...	104	112
Temp. in Vesey St. M. H. ...	138	...	...	118	112	...	94	89
Temp. Ducts $\frac{1}{2}$ way across								
B'way.....	...	209	209	190	170	...	162	146
	...	208	208	181	172	181	156	...
	...	209	209	180	160	...	...	...

Upon the complaint of this Company in June, the New York Steam Heating Company expressed their great desire to rectify the leaks in their mains existing at this point, and stated that the complete repairs that they had been making to their Broadway line had been interrupted at Park Row by the construction of the subway, and postponed until the completion of the latter. This they would proceed to complete at once. The table shows that by the end of July there was a very perceptible diminution of the extreme heat measured at this crossing. This improvement was continued, as shown by the observations on September 21st, and further on October 2d, the total diminution from the original observations being a decrease of heat of 64 degrees in the Ann Street manhole, of 49 degrees in the Vesey Street manhole and of 61 degrees in the ducts measured at a point half way across Broadway and approximately underneath the steam mains, presumably the hottest point in the crossing. It will be noticed that the heat in the manholes at the crossing still remains 89 degrees and 112 degrees, and in the ducts 148 degrees, all of which, except in the Vesey Street manhole, are still high enough to be prejudicial to the cables in the ducts. I would call your attention to the fact that when a steam leak occurs the surrounding ground in the course of a week or so becomes so heated up with the condensed steam that, there being no vent for its escape into such spaces as the subway, sewers, etc., when the leak is stopped the time required for this mass to cool down is very considerable and accounts in a great measure for the slow improvement shown in the temperature observed. It is not unlikely that the decrease will continue, provided no renewal of the leakage takes place.

The cables in the ducts at this point were Kerite cables, the property of the Western Union Telegraph Company, and when withdrawn showed very serious deterioration (as the sample of the wrapping herewith submitted testifies to, having been subjected to a heat in the ducts, according to the table, of as high as 209 degrees).

The Patterson lead covered cables with paraffine insulation used generally by the Metropolitan Telephone and Telegraph Company, are readily affected by heat, Mr. Patterson stating that there is very closely a decrease of one half of the insulation for a rise of over ten degrees of temperature, the starting point of measurement being the insulation taken at 65 degrees. Thus, for example, if 1,000 megohms is the insulation at 65 degrees, it would be 500 at 75 degrees, 250 at 85 degrees, 125 at 95 degrees, and so on.

The Telephone Company is now putting in two lead covered cables at this crossing, and are endeavoring to provide against the serious and excessive heat by leaving out the paraffine insulation and relying solely upon the insulation obtained from the dry wrapping of the cable conductors. What success will attend the use of this lower insulation and to what extent the wrapping will be affected remains to be seen.

Second. On September 20th, the Western Electric Company, which is putting in the cables used by the Metropolitan Telephone and Telegraph Company, made complaint about the excessive heat observed in the manhole on the west side of Broadway at Exchange Alley, and called upon us to do something to rectify the evil. They stated that the increase of temperature had been very rapid, and even after the manhole had been opened several hours and the blowers applied the heat would not be much reduced. The annexed table shows the temperature measured on the several days, viz.:

TABLE B.

EXCHANGE ALLEY AND BROADWAY.

	Sept. 20.	Sept. 22.	Sept. 24.	Oct. 2.
Temperature in Manhole.....	122	180	160	145

Third. All the manholes on the Broadway line between Vesey and Morris Streets, inclusive, were measured as to temperature on October 2d, and gives the following result, viz.:

TABLE C.

Manhole at Vesey Street, 89 Degrees.	
" " Fulton " 85 "	
" " Dey " 84 "	
" " Cortlandt " 82 "	

TABLE C.

Manhole at Liberty Street, 80 Degrees.	
" " Cedar " 134 "	
" " Pine " 108 "	
" " Rector " 125 "	
" " Exch'ge Ay 145 "	
" " Morris Street, 84 "	

It will be observed that from Vesey to Cortlandt Streets the temperatures were not above what a summer temperature, such as might be measured near the surface of the pavement, would give, and are probably not excessive. At Cedar Street the temperature of 134 degrees shows conclusively the presence of a leak at that point. An interval then occurs in which the diminished heat indicates that the conduit is still affected by the neighboring leaks. At Rector Street 125 degrees and at Exchange Alley 145 degrees establish two dangerous leaks on this section which the observations show to be still maintained and probably on the increase. From Exchange Alley to Morris Street the line is not seriously affected.

Fourth. This morning it is reported that there is a very perceptible increase of heat in the Church Street line near Trinity Place, and it is developing quite rapidly.

In nearly all of the above cases and particularly in the manholes where the higher temperatures exist, on opening them the presence of live steam is detected, which apparently comes from the surrounding ground and fills the manholes with heated vapor. The use of the blowers after awhile dispels the vapor, but the reduction of heat by the use of the blowers is exceedingly slow and imperfect. The presence of the steam added to the existence of illuminating gas in the subways makes it almost impracticable for men to do their work in the manholes aside from the effect on the cables. Experienced cable men, such as splicers and others, on different occasions have absolutely refused to enter manholes to perform the necessary work. In making splices the men have to remain nearly all day in the manholes and the conditions under which they are obliged to work thus become of great importance. With regard to the subway men who have charge of the opening and cleaning of manholes in all these cases, we do not allow them to go down except with a rope around them as an additional safeguard in case of accident.

With regard to a remedy for this state of things at the present time I am only prepared to recommend this Company to again call upon the New York Steam Heating Company to make such repairs on their lines as will prevent a recurrence of steam leaks, which injure the property of other corporations. The points at which the above Company should be called upon to make repairs are at the manholes at Broadway, Cedar street, Rector street and Exchange Alley, and the point on Church street near Trinity Place where the heat is developing. With regard to Broadway at Park Row a little longer experience in order to see if the temperature continues to decrease is desirable before repeating the complaint at this point. It is not to be concealed, however, that while the Steam Company may repair their pipes at the points named, the trouble is extremely liable to break out again at other or adjacent points, and that no permanent security exists with the present construction of the Steam Heating Company—on the other hand I do not know of any method by which the subway construction can be modified or improved so as to protect the cables better than is done at present. So far as the subway can be seriously affected by the steam heat this is very unlikely, as only the most permanent construction as well as materials that are not affected by heat have been employed on the lines in the districts at present occupied by the steam mains. Any additional protection to the conduits, such as greater thickness of concrete, hollow walls, etc., would only delay the penetration of the heat for a few hours longer and would not affect the final result.

I am, therefore, of the opinion that the remedy does not lie in any way within the power of the Subway Company. The correction lies solely with the New York Steam Heating Company, which is meantime responsible for all damages resulting from their failure to keep their pipes from leaking.

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The providing of vents through manholes or otherwise for steam leakages would prevent the latter from getting into the ground and would probably remedy or greatly diminish the evil. This suggestion might be submitted to the Steam Company as worthy of their consideration. I am

Very respectfully,

(Signed)

LEONARD F. BECKWITH, Chief Engineer.

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,

No. 18 CORTLANDT STREET.

NEW YORK, N. Y., October 16th, 1888.

MR. EDWARD LAUTERBACH, President Consolidated Telegraph & Electrical Subway Company, No. 18 Cortlandt Street, New York, N. Y.:

DEAR SIR:—I herewith submit the report of the temperatures taken to-day in the manholes on Broadway at the intersection of the streets named below:

TABLE D.

Manhole at	Ann street,	122	Degrees.
" "	Fulton street,	80	"
" "	Dey street,	81	"
" "	Cortlandt street,	76	"
" "	Liberty street,	81	"
" "	Cedar street,	132	"
" "	Pine street,	102	"
" "	Rector street,	118	"
" "	Exchange Alley,	158	"
" "	Morris street,	81	"

This Table D gives the temperatures at the same hanholes given in Table C (with the exception of Vesey street, for which the manhole at Ann street has been substituted), contained in my communication of the 5th inst. You will notice that the temperature has increased at Exchange Alley and practically maintains itself at Cedar street. At both these points it is to be presumed that a leak exists. You will notice also that the temperature in the Ann street manhole, which was 112 degrees, on October 2d has arisen to 122 degrees in spite of the repairs made at this point by the Steam Heating Company.

Very Respectfully,

(Signed)

LEONARD F. BECKWITH, Chief Engineer.

[OCTOBER 17, 1888.]

In connection with the communication of the Consolidated Telegraph and Electrical Subway Company the following application was read:

NEW YORK, October 15, 1888.

To "The Board of Electrical Control":

Permission is hereby requested by the Western Union Telegraph Company, operating electrical conductors in the City of New York, to hang five (5) 50-conductor cables between this building and the corner of Broadway and Exchange Place, two of said cables to be extended thence to Produce Exchange, and two to 16 Broad street, all on existing poles.

This application is made necessary by reason of all Broadway cables, including those to the Stock, Consolidated and Produce Exchanges, which are becoming so badly baked and as thoroughly useless as the City Hall section across Broadway because of the steam heat.

The cables are like a mass of jelly, conductors are giving out daily, and, as the Subway People state the steam pressure is becoming greater each month (their respective records showing an increase of twenty degrees within the past few weeks), no remedy is at hand. These wires carry our most important circuits, and immediate relief is needed.

Subject to the Rules and Regulations of the Board.

Very respectfully,

W. C. HUMSTONE, Sup't.

Commissioner Gibbens:—In order that we may be fully informed as to the facts in the matter—as to the remedy—as to whether it is the fault of the Western Union Telegraph Company's cables, or the fault of the Subway Company's construction, or the Steam Heating Company's construction, I move the following resolution:

Resolved, That the communication of the Consolidated Telegraph and Electrical Subway Company, dated October 17, 1888, in relation to the condition and repairs of the Park Row and other downtown subways, and the application of the Western Union Telegraph Company, dated October 15, 1888, be referred to the Expert of the Board; that he be requested to make a personal examination and report to the Board his views in the matter at the meeting on Friday morning; and that the Superintendent of the Western Union Telegraph Company, the President of the New York Steam Heating Company and the President of the Consolidated Telegraph and Electrical Subway Company be requested to appear before the Board at that meeting at 12½ p. m.

Unanimously adopted.

Nicholas R. O'Connor, on behalf of the Electric Power Company, presented to the Board the following Petition:

To the Honorable the Board of Electrical Control in and for the City of New York:

GENTLEMEN:—The Electric Power Company, a corporation duly organized in, under and pursuant to the Manufacturing Corporation Act, so called, and having lawful right to manufacture and use electricity for producing light, heat or power, as contemplated by Chapter 73 of the Laws of 1882, passed April 17, 1882, entitled an Act to authorize Gas Light Companies to use electricity instead of gas for lighting streets, public places and public and private buildings in Cities, Villages and Towns within this State, respectfully requests your Honorable Board under and pursuant to the provisions of Section 1., Chapter 716 of the Laws of 1887, entitled An Act in Relation to Electrical Conductors in the City of New York, to consent that your Petitioner may have power to lay, erect and construct suitable wires or other conductors with the necessary poles, pipes or other fixtures in or on, over and under the streets, avenues and public parks and places of the City of New York, for conveying and distributing electricity within the said City, under such reasonable regulations as your Honorable Board may provide.

And the said Electric Power Company further respectfully requests your Honorable Board to exercise all powers conferred upon it by the said Chapter 716 of the Laws of 1887 and by any prior or other law of this State to enable your petitioner to prosecute the transaction of business for which it was organized and to erect, locate and construct electrical conductors in the City of New York through the said streets, avenues, public parks and places thereof, upon such terms and conditions as the public convenience and welfare may require and as your Honorable Board shall determine to be proper.

In witness whereof, the said Electric Power Company has caused this application to be signed by its President and attested by its Secretary this 15th day of October, 1888.

ELECTRIC POWER CO.,

(Seal) Attest:

By H. M. HAWKESWORTH, Pres't.

HENRY T. BUELL, Sec'y.

Commissioner Gibbens offered the following resolution:

Resolved, That the Petition of the Electric Power Company for permission to prosecute the business for which it was organized and the papers accompanying same be referred to a committee to be appointed by the Chair, to report at the next meeting as to whether they are in proper form.

Unanimously adopted.

The following Petition was also presented:

To the Honorable the Board of Electrical Control in and for the City of New York:

GENTLEMEN:—The Manhattan Electric Light Company, Limited, a Corporation duly organized in May, 1888, under and pursuant to the Business Corporations Act, so-called, passed June 21st, 1875, and the amendments thereto, with lawful right to manufacture, transmit and use electricity for producing light, heat or power as contemplated by the Act, Chapter 73 of the Laws of 1882, passed April 17, 1882, entitled "An Act to Authorize Gas Light Companies to use electricity instead of gas for lighting

streets, public places, and public and private buildings in cities, villages and towns within the State," respectfully requests your Honorable Board under and pursuant to the provisions of Section I. of the Act, Chapter 716 of the Laws of 1887, entitled "An Act in relation to Electrical Conductors in the City of New York," to consent that your Petitioners may have power to lay, erect and construct suitable wires or other conductors with the necessary poles, pipes or other fixtures, in, on and under streets, avenues and public parks and places of the City of New York, for transmitting and distributing electricity within the said City under such reasonable regulations as your Honorable Board may provide.

And the said Manhattan Electric Light Company, Limited, further respectfully requests your Honorable Board to exercise all powers conferred upon it by the said Act, Chapter 716 of the Laws of 1887, and by any prior or other law of this State to enable your Petitioner to begin and prosecute the transaction of the business for which it was organized and to erect, locate and construct electrical conductors in the City of New York and through the said streets, avenues, public parks and places thereof, upon such terms and conditions as the public convenience and welfare may require and as your Honorable Board shall determine to be proper.

In witness whereof, the said Manhattan Electric Light Company, Limited, has caused this application to be signed by its President and attested by its Secretary this 18th day of September, 1888.

A. HERRINAM, President.

(Seal) Attest:

L. LEVY, Secretary.

Commissioner Gibbens offered the following resolution:

Resolved, That the Petition of the Manhattan Electric Light Company, Limited, for permission to prosecute the business for which it was organized and the papers accompanying same be referred to a committee to be appointed by the Chair, to report at the next meeting as to whether they are in proper form.

Unanimously adopted.

Commissioner Gibbens moved the following resolution:

Resolved, That the Engineer of the Board be associated with Mr. Wheeler, our Expert, in making a report, under the resolution passed at this meeting, on the condition, &c., of the downtown subways.

Unanimously adopted.

A representative of the Empire and Bay State Telegraph Company appeared before the Board, and stated that the Company was a domestic corporation, that it had completed its line from Boston to the City Limits, and that it desired to come into the City.

President Hess stated that the Company would have to make a formal written application, and offered the following resolution:

Resolved, That the application of the Empire and Bay State Telegraph Company to come into the City be regarded as made, and that such application be referred to the committee to be appointed under the resolutions referring the Petitions of the Electric Power Company and Manhattan Electric Light Company.

Unanimously adopted.

President Hess appointed Commissioner Gibbens the committee under the resolutions referring the Petitions of the Electric Power Company and the Manhattan Electric Light Company, Limited, and the application of the Empire and Bay State Telegraph Company.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to write a letter to W. C. Humstone, Superintendent of the Western Union Telegraph Company and call the attention of that gentleman to the fact that the Western Union Telegraph Company has three lines of poles running through 46th street; that the rights which were given to telegraph companies to have their wires in the streets of cities is bounded by the conditions that the wires and poles must be necessary to the business of the company, and constructed in such a manner as meets the approval of the authorities; that it is not necessary to the business of any one company to have three lines of poles on any one street; and the Board respectfully requests the Western Union Telegraph Company to consolidate all their wires on one line and remove the others as soon as possible.

After some discussion, Commissioner Gibbens withdrew this resolution.

Expert Wheeler presented the following report:

OCTOBER 17th, 1888.

Board of Electrical Control:

GENTLEMEN:—Up to the present time your Expert's Department has sent to the Bureau of Incumbrances 283 notices of violations of the rules and regulations, of these 183 relate to dead wires, none of which have been acted upon, 100 relate to dead poles, of which 40 have been acted upon, while 60 remain unattended to. The latter comprises all the notices but 13 of dead poles and dead wires belonging to the United States Illuminating Company and about 33 miscellaneous notices. No dead wires have been removed by the Bureau of Incumbrances, excepting in a few cases to clear lines of poles which were to be taken down, the Superintendent of the Bureau stating that he has no force of men with which to do this work.

The action on the poles and wires of the United States Illuminating Company has been deferred in consequence of the receipt of letters from said Company, stating in substance that their wires are not dead, and in view of these the Superintendent of the Bureau of Incumbrances requests that the cases be re-inspected for verification, and if again found to be as stated in our notices he will make the removals.

The work of removing dead poles has been carried on continuously from the time it was started until October 15th, when it was discontinued through misunderstandings. The 40 notices which have been acted upon by the Department of Public

Works have entailed the removal of 312 dead poles, 404,183 feet of dead wire. There have been 214 new notices of violations of rules and regulations sent to companies since the last meeting according to the accompanying schedule.

The Johnstone distributing system has been completed on Broadway from 14th street to 25th street.

The eight conductor electric light cable to be laid on Broadway by the Brush Company has all been drawn into the conduits, and the splices being made at every manhole are nearly completed for the whole length.

The following is a list of all the wires now on the streets stated, as called for by the resolution passed at the last meeting of the Board:

Broadway, between 14th and 58th streets.—Western Union, American Dist., Mutual Dist., District Tel., Gold & Stock, Met. Tel. & Tel. Co., Brush, Fire Dept., Police Dept., Postal Tel. to Hoffman House, Holmes Burglar Alarm to Hoffman House, Commercial Tel. Co., Stock Quotation Tel. Co., New Jersey Central R. R. (1 wire), Penn. R. R. (N4 wires).

Sixth avenue from 18th to 58th streets.—Brush, East River, U. S., Western Union, Met. Tel. & Tel. Co., Mutual Dist., Kiernan's Ticker, Fire Dept.

Cross streets from 14th to 58th streets between Broadway and Sixth avenue:

23d Street.—Brush, U. S., Met. Tel. & Tel. Co.

24th Street.—W. U. and Fire Dept.

25th Street.—U. S.

26th Street.—W. U. Tel. Co. (Am. Union poles).

27th Street.—U. S., useless loops; Met. Tel. & T. Co.

28th Street.—Brush.

29th Street.—No poles.

30th Street.—W. U., U. S.

31st Street.—No poles.

32d Street.—No poles.

33d Street.—No poles.

35th Street.—No poles.

36th Street.—No poles.

37th Street.—No poles.

38th Street.—No poles.

39th Street.—Met. Tel & Tel. Co.

40th Street.—W. U. Tel. Co.

41st Street.—W. U. Tel Co.; U. S.

42d Street.—U. S.

43d Street.—No poles.

44th Street.—Fire Dept.

45th Street.—Met. Tel. & Tel. Co.

46th Street.—Met. Tel. & Tel. Co.

47th Street.—No poles.

48th Street.—Fire Dept.

49th Street—No poles.

50th Street—No poles.

51st Street—W. U. (Fire wires on the poles).

52d Street—Am. Union poles (2 wires) W. U. Co.

53d Street—Fire Dept. bet. B'way & 7th Ave.

54th Street—Fire Dept.

55th Street—W. U. & U. S.

56th Street—Met. Tel. & Tel. Co. bet. B'way & 7th Ave.

57th Street—No poles.

58th Street—Fire Dept.

Your Expert has had several conferences with the representative of the Western Union Telegraph Company, with the following results: The Telegraph Company has gained permission from the proprietors of all the hotels on Broadway, in which telegraph offices are located, to make the necessary underground connections to these offices, including the changing of their Fifth avenue office into a pneumatic dispatch tube office connected directly with their 23d street branch. They are now preparing estimates for the cable necessary to carry all of their circuits, on Broadway and Sixth avenue, from 14th street to 59th street. As soon as prepared, these cables will be run in the conduit from 14th to 34th streets on Broadway and upon the Elevated Road structure from 34th to 59th streets, enabling the Company to dispense entirely with all wires and poles on Broadway and Sixth avenue from 14th to 59th streets.

The majority of the wires of less importance, named in the schedule, are now maintained by the Western Union, and the completion of this cable work will therefore render possible the removal of the majority of the lines given in the list.

The Brush cable is nearly completed, as previously stated, the East River Electric Light Company's cable is in manufacture, and there remains only the United States Illuminating Company inactive.

In reference to the heavy line of telegraph poles on Park Row from the main office to the Brooklyn Bridge, the representative of the Telegraph Company claims that it is impossible to put their wires underground across Broadway and for a distance of about 500 feet up Park Row, on account of the intense heat produced by the pipes of the Steam Heating Company, sufficient to melt the insulation of any cable. They also state that there are 400 wires underground in the lower part of Broadway which are being destroyed by the same cause. It would seem to be necessary to take some immediate action in this matter, either requiring the Telephone Company to use a better quality of cable or stopping the steam heating or by cooling the conduits by a circulation of air drawn inside or outside of the tubes of the Subway.

Very respectfully,

S. S. WHEELER, Elec. Exp. to the Board.

REPORT OF ELECTRICAL EXPERT.

Details of all Notices of Violations of Rules and Regulations sent from Sept. 10th to Oct. 15th.

	No. of Violations.	Notices sent.	Second Notices.	Notices Answered.	Notices Attended to.	Notices sent to B. of I.	Notices R. to B.
U. S. Co.							
Dead Poles.....	13	3	3	..	..	3	..
Dead Wires.....	16	10	10	..	..	10	..
Low Lamps.....	16	16	..	..	..	..	..
Useless Poles.....	8	4	4	..	..	4	..
Useless Loops.....	5	4	..	..	..	..	..
Dangerous Poles.....	1	1	..	..	..	..	..
Total.....	59	38	17	..	..	17	..
Brush Co.							
Dead Poles.....	1	1	..	..	..	..	..
Dead Wires.....	5	4	..	..	..	..	..
Low Lamps.....	2	2	..	..	..	..	..
Useless Poles.....	3	2	..	..	..	1	..
Useless Loops.....	2	2	..	..	..	..	..
Total.....	13	11	..	..	..	1	..
Ball. Co.							
Useless Fixtures.....	1	1	..	..	..	..	..
Fire Dept.							
Dead Wires.....	5	5	..	..	..	..	..
Dead Poles.....	2	2	..	..	..	..	..
Dangerous Poles.....	1	1	..	..	..	..	..
Total.....	8	8	..	..	..	..	..
Police Dept.							
Dead Wires.....	1	1	..	..	1	..	..
American U.							
Dead Poles.....	8	1	9	..	..	8	..
Met. T. & T. Co.							
Dead Wires.....	51	40	..	2	1	..	..
Dead Poles.....	1	1	..	..	..	..	..
Dangerous Poles.....	1	1	..	..	..	..	..
Useless Poles.....	2	2	..	1	2	..	..
Total.....	55	44	..	3	3	..	..
W. U. Tel. Co.							
Dead Wires.....	112	72	..	5	..	..	..
Dead Poles.....	456	9	7	..	..	7	..
Dangerous Poles.....	3	3	..	..	..	..	..
Total.....	571	84	7	5	..	7	..
French Cable Co.							
Dead Wires.....	27	2	..	..	..	2	..

	No. of Violations.	Notices sent.	Second Notices.	Notices Answered.	Notices Attended to.	Notices sent to B. of I.	Notices R. to B.
No Owner.							
Dead Poles.....	49	13	..	..	..	13	..
Dead Wires.....	28	8	..	..	..	8	..
Dangerous Poles.....	2	2	..	..	..	2	..
Total.....	79	23	..	..	..	23	..
Harlem Co.							
Useless Loop.....	1	1	..	1	..	..	..
Grand Total.....	823	214	..	..	4	58	..

DEPARTMENT OF BUREAU OF INCUMBRANCES.

Number of miles of wire removed.....	76½
Number of dead and useless poles removed.....	312
Number of notices sent of dead wires.....	183
Number of notices sent of dead poles.....	100
Total notices sent.....	283
Notices of dead poles acted on.....	40
Notices of dead poles not acted on.....	60
Notices referring to U. S. Co.....	40
of which	13
have been acted upon, leaving.....	27
notices of dead poles not acted on.	

Notices pertaining to dead wires were taken up to-day and work commenced on the B. & O. cable at No. 63 Broadway, &c.

Commissioner Gibbens offered the following resolutions:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, "to set 120 poles in place of poles now standing, using 70 feet poles, to be set 6 feet in the ground, and to string 20 wires on same, as follows: On 3d Ave., from Harlem River to 161st St., thence on Boston Ave. to 169th street, and to put five (5) ten-pin arms from the River to 160th street and three (3) ten-pin arms from 160th St. to 169th St., and also to transfer all wires from the old to the new poles," be granted.

Unanimously adopted.

Resolved, That the application of the Brush Electric Illuminating Company, dated October 16th, 1888; "to repair wires and replace fixtures at 358 Sixth avenue, also to connect electric lamps with our circuits at 809-811 Broadway," be granted.

Unanimously adopted.

Resolved, That the Board have a regular meeting on Tuesdays and Fridays, at 12 o'clock M.

Unanimously adopted.

Resolved, That the application of the Harlem Lighting Company, dated October 17th, 1888, to run two extra wires on its poles from 122d street to 124th street on Third avenue, in order to supply a contract for lights at 124th street and Third avenue, be granted.

Unanimously adopted.

The following communications were read:

NEW YORK, Oct. 17th, 1888.

To the Board of Electrical Control, City:

GENTLEMEN:—Some time ago your honorable Board issued a permit to us authorizing the substitution of new wooden poles for the iron ones now owned by our Company. This request was made and was granted because of the danger of such construction. Acting upon such permit, we made a purchase of wooden poles of the very best quality, which we are now and have been for some time ready to substitute for our iron poles and for which we now ask your permission.

Respectfully,

HARLEM LIGHTING CO.,

Per ABRAM C. BERNHEIM.

NEW YORK, Oct. 16th, 1888.

Board of Electrical Control, 1218 Broadway, N. Y. City:

SIRS:—Your notice No. 1256, stating to remove our wires from a line of 5' dead poles in 125th street from 2d Ave. west, and No. 1257, stating to remove our wires from a line of 32 dead poles in 124th street from 2d avenue to 1st avenue, and on 1st Ave. from 124th street to 110th street, are received.

We beg to inform you that these poles are in use, and not dead.

Trusting the above will receive your attention,

We are yours respectfully,

THE HARLEM LIGHTING CO.

NEW YORK, Oct. 17th, 1888.

To the Board of Electrical Control, City:

GENTLEMEN:—We respectfully make application herewith for permission to stretch our wires on the poles of the Western Union Telegraph Company on First and Second avenues, pending your action on our application for the purchase of these poles.

Respectfully,

HARLEM LIGHTING CO.,

Per ABRAM C. BERNHEIM.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Secretary be directed to write a letter to the Harlem Lighting Company, and to state that it has violated the law in putting its wires on dead poles, and that it had better take them down as soon as possible.

Unanimously adopted.

Resolved, That the application of the Brush Electric Illuminating Company to connect an electric lamp with its circuit at 768 Broadway, also its application to connect an electric lamp with its circuit at 1361 Broadway, be granted.

Unanimously adopted.

President Hess offered the following resolution:

Resolved, That the application of W. L. Wheeler & Co., dated October 15th, 1888, to repair their two private telegraph wires be laid over.

Unanimously adopted.

Commissioner Gibbens offered the following resolutions:

Resolved, That the two applications of the East River Electric Light Company to hang lamps and connect same with circuits respectively at 37 West 21st street and 124 Sixth avenue be granted.

Unanimously adopted.

Resolved, That the application of the Brush Electric Illuminating Company to set one pole temporarily on 16th street, between Broadway and Fifth avenue, be granted, the poles to be uniform with the poles of that Company on Fifth avenue.

Unanimously adopted.

Resolved, That the temporary permit, No. 1878, be granted to S. S. Wheeler, to run two loops into the Young Men's Christian Association building, corner of 23d street and 4th avenue, be made permanent.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Friday, October 19th, 1888, at 11 o'clock A. M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

On motion of President Hess, the reading of the minutes of the last meeting was dispensed with.

Engineer Kearny, of the committee appointed at the meeting of October 17 1888, to ascertain the condition of Park Row and other downtown subways, stated to the Board that the New York Steam Heating Company was at work digging down to its steam pipe at the crossing at Broadway and Exchange Place, but as the work can only be prosecuted at certain hours of the night, and the pipe is some thirteen feet below the surface at this point, that Company had not yet been able to reach it, and a report would have to be deferred until a later date.

Commissioner Gibbens: I am ready now to report on these applications for franchises made by the Electric Power Company and the Manhattan Electric Light Company referred to me at the last meeting. As far as these papers go, the companies seem to me to be properly organized, and the applications are in the form which has been adopted by the Board. The standing of these companies is not precisely the same. One of them is organized under the business corporations' act, and the other under the manufacturing corporations' act; but corporations organized under both of these acts have heretofore received permission from the local authorities in the city, and I believe that both of these corporations are entitled to receive the permission which they desire to do business.

President Hess directed that the applications be considered separately.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Manhattan Electric Light Company, Limited, is hereby authorized and empowered to lay, erect and construct suitable wires or other conductors with the necessary poles, pipes, or other fixtures in, on, over and under streets, avenues and public parks and places of the City of New York for conducting and distributing electricity, and to the full extent that could, with the consent of the Municipal authorities of the City of New York, be given to any Gas Light Company, under or by reason or in pursuance of an application made by any of the corporations referred to in Chapter 512 of the General Statutes of New York, for the year 1879, or to any Company organized under the so-called manufacturing corporations' act, Chapter 40, of the Laws of 1848, or to any corporation organized under an act to provide for the organization and regulation of certain business corporations, passed June 21st, 1875, with all the amendments thereto, in pursuance of the provisions of the act, Chapter 73, of the General Statutes of New York, for the year 1882, under the

direction of the Board of Electrical Control, and of the Commissioners of Public Works, and of the Department of Public Parks, within their respective jurisdictions; and subject to all existing rules applicable thereto, and to all regulations of the privileges hereby conferred, which this Board may hereafter impose by resolution or otherwise; provided, always, and this consent is given upon this express condition, and not otherwise, that, except as otherwise permitted by order or resolution of this Board, the electrical conductors of the said Company shall be laid, erected or constructed, and the privileges above granted shall be exercised only in and through subways constructed by the Consolidated Telegraph and Electrical Subway Company, under and in pursuance of the provisions of the act, Chapter 716, of the Laws of 1887, under and in pursuance of the supervision of this Board, to be leased to said Company by the Consolidated Telegraph and Electrical Subway Company.

And provided further, that as compensation for the privilege hereby granted, the said Company shall pay to the City of New York a sum equal to one cent per lineal foot of street occupied by its conductors.

And provided still further, that in case the said company shall furnish arc lights to any customer in the City of New York, then in that case the Company shall furnish, maintain and light in the streets or avenues occupied by said Company, free of any charge to the City, for maintenance, or otherwise, and at such place or places as may be determined by the Board of Street Lighting, one full arc light, of power equal to the average required at the time in contracts with the City for electric lights, for every fifty arc lights furnished by said Company to its customers, and shall make returns, under oath, of the number of such private arc lights whenever required by the said Board of Street Lighting.

Unanimously adopted

Resolved, That the Electric Power Company, of New York, is hereby authorized and empowered to lay, erect and construct suitable wires or other conductors with the necessary poles, pipes or other fixtures in, on, over and under streets, avenues and public parks and places of the City of New York, for conducting and distributing electricity, and to the full extent, that could, with the consent of the municipal authorities of the City of New York, be given to any gas light company under, or by reason, or in pursuance of an application made by any of the corporations referred to in Chapter 512 of the General Statutes of New York, for the year 1879, or to any company organized under the so-called manufacturing corporations' act, Chapter 40, of the Laws of 1848, in pursuance of the provisions of the act, Chapter 73, of the General Statutes of New York, for the year 1882, under the direction of the Board of Electrical Control and of the Commissioners of Public Works and of the Department of Public Parks, within their respective jurisdictions; and subject to all existing rules applicable thereto, and to all regulations of the privilege hereby conferred, which this Board may hereafter impose by resolution, or otherwise; provided, always, and this consent is given upon this express condition, and not otherwise, that until the

further order or resolution of this Board the electrical conductors of the said Company shall be laid, erected or constructed, and the privileges above granted shall be exercised only in and through subways constructed by the Consolidated Telegraph and Electrical Subway Company, under and in pursuance of the provisions of the act, Chapter 716, of the Laws of 1887, under and in pursuance of the supervision of this Board, to be leased to said Company by the Consolidated Telegraph and Electrical Subway Company.

And provided further, that as compensation for the privilege hereby granted the said Company shall pay to the City of New York a sum equal to one cent per lineal foot of street occupied by its conductors.

And provided still further, that in case the said Company shall furnish arc lights to any customer in the City of New York, then in that case the Company shall furnish, maintain and light in the streets or avenues occupied by said Company, free of any charge to the City, for maintenance or otherwise, and at such place or places as may be determined by the Board of Street Lighting, one full arc light of power equal to the average required at the time in contracts with the City for electric lights, for every fifty arc lights furnished by said Company to its customers, and shall make returns, under oath, of the number of such private arc lights whenever required by the said Board of Street Lighting.

Unanimously adopted.

The Board thereupon went into the consideration of the proposed rules and regulations for overhead conductors for electric light and power. Pending the consideration of these rules, Commissioner Moss asked that the Board suspend their further consideration that it might hear from President Lauterbach, of the Consolidated Telegraph and Electrical Subway Company, in the matter of the condition of the Park Row and other downtown subways and the connection of the New York Steam Heating Company therewith. President Hess—there being no objection—so directed.

President Lauterbach read to the Board his communication to it of October 17, 1888, and forming part of the minutes of the meeting of that date. He stated that his Company have built in the section of the city referred to in his communication, as well as in every other section, the best subways that have been known, constructed them in the best manner, spared no expense or trouble in their construction, have been ready to follow every suggestion that has been made by the Board, or by companies which intended to use them, have met with adverse criticism, but with no difficulty, except the difficulty of the operation by a private company of a franchise which it has secured, and which, while it has every right of using, it has no right of abusing.

Mr. W. C. Andrews, President of the New York Steam Heating Company, appeared before the Board and made the following statement:

"I wish to state that in the inception of our enterprise of introducing steam in the streets of New York, I was at that time in the control of the Company, and have been ever since. I gave instructions to our Engineers that our work should be done on the largest factor of safety known to the scientific world. I had understood that the Pennsylvania Railroad built its railroad bridges on the factor of safety—five to one—which was at that time higher than any other road. I think that factor of safety is now in use by all the leading railroads of the United States—five to one. I understand that the Brooklyn Bridge is built on the factor of safety between four and five to one. Assuming, therefore, that those standards, as factors of safety, were the very best known and in use in this country or in Europe—and especially where lives are in danger—I gave instructions to our Engineers to double it; that is, that all work of the New York Steam Heating Company should be upon a factor of safety of ten to one. From the knowledge I have I am able to say that it was so done—that we carry a pressure of 85 pounds per square inch as a maximum, and that our pipes and joints, when in good condition, of all our works, is able to stand 1,000 pounds in safety to the square inch. Hence I say that I have the satisfaction of knowing the instructions were carried out as to quality, material and thickness and quantity of material used to obtain these results.

"I am able to state now, after our experience of nearly seven years in operating and delivering steam in the streets of the lower part of the city, the cause of this leakage; and it is due to the New York Steam Heating Company, and it is due to the public that it should be known. It was solely from a mistake of the Engineer in one simple thing. He used some wooden wedges to key up under each joint of the Broadway mains and Cortlandt street and Maiden Lane, which are our trunk lines, large enough for a full-grown man to crawl through. Over brick piers pipe resting upon saddle—a cast iron saddle—he keyed up with some oak wedges, instead of using cast iron. The difference in cost of the entire two miles laid in that way would not have been \$100. The books will show that the New York Steam Heating Company have already expended in the effort to rectify this simple mistake or oversight of the Chief Engineer of the Company—we have already expended at last \$250,000, and suffered all this disgrace.

"Now, in our uptown system, which has been in operation over two years, not one single leak has ever been developed; and your Chief Engineer tells us there is no complaint—not one single leak has developed in the two years' operation. We substituted the cast iron wedges to key up with on that part of our work. Now, it was not expected that these wooden wedges would support anything; that pipe rested upon brick piers capped with a flagstone, which supported the cast iron saddle, but they were used to key up, and they have to use concrete in their stead, but the heat of the pipe crumbled the wedges sufficiently to make a small settlement, and the result has been that it has sprung the joints in numerous places sufficient to break the jacket of the joint.

"Now, this, gentlemen, is the cause of the whole thing. There is no other cause of leaks. Now, it is due to the New York Steam Heating Company to state this fact that a large proportion of the complaint has come from what Mr. Lauterbach referred to, to which I had called his attention—that the vapor or steam that escapes in a street in very numerous instances has come from leaking of the Croton water mains, which are above the steam pipe, and the dripping or the leaking of the hydrants, getting into our conduit, and coming in contact with the hot pipe, boils the water and produces steam. The particular instance at Park Row, where there has

been most complaint made of the interference with the subway wires, was found, upon investigation, to be not the fault of the Steam Heating Company. There was no leak there of the Steam Heating Company pipes at all, but it was the leak of the Croton water hydrant and the water running into our conduit and producing the escape of steam. I know it has occurred also in Fulton street and Maiden Lane in numerous places.

"Now, the Steam Heating Company has always, whenever attention has been called or complaint made of the leak, has gone immediately and given it attention and stopped it. I am glad to be able to state also that the number of leaks developing is very materially reduced. We have already gone over our pipes to such an extent that we think we have conquered at least three-quarters of all of the leaks of the pipes owing to this mistake in its construction to which I have referred. I think within a short time that we will be able to stop all the leaks and prevent any further complaint. We recognize that it is our duty to do so. We expect to do so. We spare no pains and no expense, and we expect to spare none. We expect to work by day and by night, and there is now on a gang of men after this complaint was made; and before that there was no complaint, but as soon as complaint was made we have put a force on both by night and by day to remedy in this place to which our attention has been called. We do not intend to be derelict in our duty to those corporations which are occupying streets conjointly with us or in our relations with the public in any way, but shall hold ourselves in readiness to attend to any complaint that is made."

The Board directed that the further consideration of this matter be left over until the next meeting, when the Expert and the Engineer would probably be ready to report.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the East River Electric Light Company, dated October 17, 1888, "to string two wires on existing poles of the Brush Illuminating Co. and the U. S. Illuminating Co., on Sixth avenue, from 18th to 36th streets, for the purpose of lighting city lights, and pending the placing of wires now ordered in conduits," be granted.

Unanimously adopted.

The Board directed that a communication from the Safety Light and Power Company, dated October 16, 1888, approving of the proposed rules and regulations for overhead conductors for electric light and power be filed.

The following communication was read:

NEW YORK, Oct. 16, 1888.

JACOB HESS, ESQ., President Board of Electrical Control:

DEAR SIR:—Herewith please find copies of letters received from Eugene T. Lynch, Esq., of the U. S. Illuminating Co., relative to dead poles, fixtures, &c., as reported by your Board.

Please advise me regarding the same and oblige.

Yours respectfully,

JOHN RICHARDSON, Supt. of Incumbrances.

OCTOBER 19, 1888.]

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THE UNITED STATES ILLUMINATING CO.,
59 & 61 LIBERTY ST.,
NEW YORK, Oct. 13th, 1888.

JOHN RICHARDSON, Supt. Bureau of Incumbrances, Dept. Public Works:

DEAR SIR:—We have been notified by the Board of Electrical Control that they have notified you to remove the following poles belonging to this Company, and reported as dead by the Board of Electrical Control:

- 2 poles at 44 & 46 Washington street.
- 1 pole S. W. cor. Morris St. & Broadway.
- 6 poles in front of Nos. 17, 19, 21 & 29 Morris St.
- 4 poles in Stanton St., at Nos. 44, 50, 58 & 60.
- 1 pole at 212 Duane street.
- 2 poles in front of Nos. 210 & 220 Duane street.
- 1 pole at 21 West street.
- 3 poles at Nos. 1, 5 & 11 West street.
- 1 pole at 29 West street.
- 1 pole at 40 West.

We beg to notify you respectfully that these are not "dead" poles, but are a part of the system of this Company and necessary for its use, and have been erected pursuant to law, and are in perfect order. Furthermore, we beg to say that no subway whatever has been constructed in their localities, and the Board of Electrical Control and your Department and the Bureau of Incumbrances are without jurisdiction in the matter.

Very respectfully yours,

(Signed)

EUGENE T. LYNCH, Pres.

THE UNITED STATES ILLUMINATING CO.,
59 & 61 LIBERTY ST.,
NEW YORK, Oct. 13, 1888.

JOHN RICHARDSON, Supt. Bureau of Incumbrances, Dept. Public Works:

DEAR SIR:—We have been notified by the Board of Electrical Control that they have notified you to remove the following wires and fixtures belonging to this Company, and reported as dead by the Board of Electrical Control:

- 2 dead wires from pole No. 24 to No. 18 West St.
- 2 dead wires running from pole S. E. cor. Canal St. & B'way to pole at 276 Canal St.
- Dead wire from 111 E. 44th St. to S. E. cor. 44th St. & Lex. Ave.
- Dead wire ending on pole at 62 Duane St.
- Useless loop on pole at No. 1324 2d Ave.
- Useless fixtures in front of 87 Nassau St.
- " " " 147 Park Row.
- " " " 150 " "
- " " " 109 South St.
- " " " 106 South St.

We beg to notify you respectfully that these are not "dead" wires and fixtures, but are a part of the system of this Company and necessary for its use, and have been erected pursuant to law and are in perfect order.

Furthermore, we beg to say that no subway has been constructed in their localities, and the Board of Electrical Control and your Department and the Bureau of Incumbrances are without jurisdiction in the matter.

Very respectfully yours,

(Signed)

E. T. LYNCH, Pres.

Commissioner Gibbens: The Expert of the Board reports that he has had all these poles and wires reinspected, and he finds that in certain cases—in two cases—new wires have been placed, without the permission of the Board, on these "dead" poles, and these new wires have been cut into circuit, and, therefore, the poles are no longer "dead" poles by reason of the fact that the law has been violated. In the other cases the poles and wires are in the same condition as they were when previously inspected; that is, they are either poles or wires which are not in use or not necessary to the business of the Company. I move the following resolution:

Resolved, That the Secretary be directed to communicate with Mr. Richardson, to enclose the report made by the Expert, emphasizing the fact that all of the cases enumerated are "dead" poles and wires within the meaning of the order of the Mayor to the Commissioner of Public Works contained in the Mayor's letter to the Commissioner some time since, and to request the Superintendent of the Bureau of Incumbrances to remove the same.

Unanimously adopted.

The following communication of the United States Illuminating Company was read:

THE UNITED STATES ILLUMINATING CO.,

59 & 61 LIBERTY ST.,

NEW YORK, Oct. 18th, 1888.

THEODORE MOSS, Esq., Secretary Board of Electrical Control:

SIR:—Application is hereby made by the United States Illuminating Company for permission to make the necessary repairs to their lines of electrical conductors and cross-arms and fixtures supporting same, not including the stretching of new wires, excepting where insulation is worn to such an extent as to require it, and not including the placing of new poles for old ones, for which special application is made.

Respectfully yours,

A. E. SCOULLAD, Supt.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Secretary be directed to advise the President of the United States Illuminating Company that, according to the Rules and Regulations of the Board now in force, all companies are directed and expected to repair their lines wherever needed, and that this applies to the United States Illuminating Company, except in the district where it has been ordered to remove its poles and wires, for which no permit to repair will be granted by this Board until it is advised that the Company, acting in good faith, is preparing to place its conductors underground, in accordance with the resolutions of the Board, as rapidly as possible.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated October 18, 1888, numbered 1978, to place electric arc lamps and fixtures and cut same into existing circuits at the places therein designated, be granted.

Unanimously adopted.

Resolved, That the application of the East River Electric Light Company, dated October 12, 1888, to hang lamps and connect same with circuit at No. 15 Greenwich avenue, be granted.

Unanimously adopted.

The following communication was read:

HEADQUARTERS FIRE DEPARTMENT,
OFFICE SUPERINTENDENT OF TELEGRAPH,
157 & 159 EAST 67TH STREET,
NEW YORK, Oct. 18th, 1888.

Hon. Board of Electrical Control, New York City:

GENTLEMEN:—In reply to yours of the 15th instant, requesting this department to remove its wires from dead poles on the east side of the city, I beg to state that it is impracticable for this department to remove its wires at this time from such poles as it depends upon for carrying or support.

Many of them, however, are only bracketed to for insulation, from such we shall be pleased to disconnect, but can only do so as the work of removal of the poles progresses; that is to say, we will have men to accompany your workmen to clear the wires as fast as they reach the poles, otherwise our wires would be too much exposed.

I also beg to suggest that this department should be advised at all times, a few hours in advance of the commencement of such work, that we may have a representative on hand. This request was made before the poles were taken down on upper Broadway, but disregarded, and we had no other notice than that of breaking some of our wires, and thereby we made the discovery, and such instances have been quite frequent.

Very respectfully,

J. ELLIOT SMITH, Superintendent.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Secretary be directed to reply to the communication of J. Elliot Smith, and to state that it is not the intention of the Board of Electrical Control to interfere with the wires of the Fire Department, and that his request to be advised in case we request of the Department of Public Works the removal of poles on which wires of the Fire Department hang, is proper, and the Board will be glad to furnish the Fire Department with all notices of removal sent to the Bureau of Incumbrances as they are sent to the Department, so that the Fire Department can be informed of all the poles which this Board considers as "dead" poles; also to notify the Fire Department, through the Inspector who accompanies the men from the Department of Public Works, when any removal is undertaken.

Unanimously adopted.

Resolved, That the Secretary request Mr. J. Elliot Smith to furnish—if it appears to the Fire Department to be proper—the Expert of the Board with a key to the fire boxes, so that he may be readily able to communicate with the Fire Department over the Morse instrument which is in the boxes.

Unanimously adopted.

Resolved, That the application of the Electric Power Company, dated October 19, 1888, to run wires as therein specified, be laid over until the disposition of the proposed rules and regulations for overhead conductors for electric light and power now pending.

Unanimously adopted.

NEW YORK, Oct. 19th, 1888.

To the Board of Electrical Control, HON. JACOB HESS, Chairman:

DEAR SIR:—Our new station, located at 80th street and Avenue B, which we will occupy jointly with the Manhattan Electric Light Company, Limited, will be ready for occupancy within a short time. By the terms of an order issued by the Hon. Judge O'Brien, we shall be compelled to vacate our present station on or before the 15th of December. We therefore respectfully make application herewith for permission to erect a line of poles from our station at 80th street and Avenue B, through 80th street, to connect from there with our main line on Third avenue, which extends to 86th street, subject to the existing rules of your honorable Board and the adoption of those now pending, of which we cordially approve.

Awaiting for your favorable action, we are,

Respectfully yours,

THE HARLEM LIGHTING COMPANY,

Per ABRAM BERNHEIM.

Commissioner Gibbens offered the following resolutions:

Resolved, That the application of the Harlem Lighting Company, dated October 19, 1888, for permission to erect a line of poles from their station at 80th street over a route therein designated be laid over until the disposition of the proposed rules and regulations for overhead conductors for electric light and power now pending.

Unanimously adopted.

Resolved, That the application of the Brush Electric Illuminating Company, dated October 18, 1888, to connect electric lamps with its circuits at 324-326 Fourth avenue, Tony Pastor's Theatre, E. 14th street, near Third avenue; Hotel Bartholdi, Broadway and 23d street, be granted.

Unanimously adopted.

The following communication was read:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,
No. 18 CORTLANDT STREET,

NEW YORK, October 18th, 1888.

To the Honorable, the Commissioners of the Board of Electrical Control, HON. JACOB HESS, President, No. 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith beg leave to submit for your approval and authorization the following crossings of electric light subways on 6th avenue, for construction during the present season, and for which we ask your favorable consideration, the same being rendered necessary by the applications filed with this Company for crossings of 6th avenue at the points named below, viz.:

37th street, 35th street, 31st street, 29th street, 27th street, 25th street, 22d street, 20th street, 18th street.

The construction of the above to consist of the cast iron "Johnstone" conduit size "C," containing six ducts, and each crossing terminating on the east side of 6th avenue with the cast iron flush box of the above system, whence the distributing or subsidiary pipe will be led to the lamp posts which the above named company desire to reach. The maps showing the location of the above lines are submitted herewith.

Very respectfully,

EDWARD LAUTERBACH, President.

Engineer Kennedy presented the following report to the Board:

NEW YORK, Oct. 19, 1888.

To the Honorable Commissioners of the Board of Electrical Control:

DEAR SIRS:—I have examined the application of the Construction Company for authority of construction of additional work, as referred to me at the last meeting, and recommend that the same be granted, viz.:

Extension of 8th Ave., west side, 28th to 45th Sts.
Barclay St., from College Place to North River.
Chambers St., from West Broadway to North River.
Spring street, from Broadway to Chrystie St.; also the
42d St. (so. side) from 5th Ave to Lexington Ave.
41st St. (north side) Mad. Ave. to Lexington Ave.
Park Ave. (both sides) from 38th to 42d Sts.
Crossing 42d St., east side of 5th Ave.
5th Ave. at 50th St.

I have to further recommend that you authorize the construction of crossings on 6th Ave., for distributing electric light wires, said crossings to be made at 37th, 35th, 31st, 29th, 27th, 25th, 22d, 20th and 18th streets, the same being necessary in order to comply with request of the East River Electric light Company.

HENRY S. KEARNY, Engineer.

Commissioner Gibbens offered the following resolution:

Resolved, That the recommendations of the Engineer made in his Report to the Board, dated October 19, 1888, in the matter of the application of the Consolidated Telegraph and Electrical Subway Company, for authority for construction of additional work therein indicated, dated October 17, 1888, and referred to him at the meeting held on the last mentioned date, and also in the matter of a like application of said Company, dated October 18, 1888, read at this meeting, be approved.

Unanimously adopted.

Adjourned.

(Appendix to Minutes of Meeting of October 19, 1888).

Remarks of Edward Lauterbach, Esq., President of the Consolidated Telegraph and Electrical Subway Company, before the Board of Electrical Control, October 19, 1888, in connection with his communication to the Board of October 17, 1888. (See Book 2 of Minutes, p. 177).

"The occasion for it—the immediate occasion that has provoked the discussion at this time—has been an application of the Western Union Telegraph Company to be permitted to suspend overhead a number of cables—five, I think—containing fifty wires each, instead of the Kerite cables which have been mentioned in the report, and which have been put in the subway at the point indicated. The Kerite cables—if I am correctly informed—used by the Western Union Telegraph Company, were good cables, though they were cables originally procured by the Baltimore and Ohio Company—if my information is correct—and intended for overhead, and not for underground use; but it is fair to say that, while a better cable than the cable that has been used would be feasible to adopt—a cable of better insulation—a cable that would be lead covered in important points, such as those extending from the Western

Union Telegraph Company building over Park Row and down to the Exchanges—yet no cable that has been so far developed could withstand the maximum degrees of heat that have been discovered and that have been produced by the leakage of the Steam Heating Company's pipes.

"It might be well at this point to say a few words of approval of your own full and hearty co-operation; but I desire to call your attention to what the Telephone Company, under your direction, has done. There are to-day built in the City of New York 500 miles of single duct. There have been opened and closed upwards of 60 miles of trench. There have been constructed and put in place over 550 manholes. There has been expended in actual cash by the Consolidated Telegraph and Electrical Subway Company a sum of money approximating one and one-half millions of dollars; perhaps somewhat more, or perhaps a little less. It stands to reason that no company that is managed by sane men would make that expenditure uselessly, or make it in a way that the investment would not bear a good business return. Not only has this Board and its Engineer supervision over the whole construction, but we have ourselves retained a corps of engineers, the best that could be procured at the time, who have been Mr. Leonard F. Beckwith and Mr. Joseph B. Davis, than whom no better engineers could be secured, and the whole construction from the beginning to the end has been under their direct supervision, and has been under the direction and control of the Board of Electrical Control; and, I think, from the time the work commenced up to the present time no criticism of any character has been made by the Board or by any company that has had the use of the subways, in respect to their usefulness and excellence of construction. It is, of course, our interest to do the best work to secure the best return.

"As indicating the view that is generally taken, the Company that uses—that it is conceded will use about 8-10ths of all the wires to be used in New York—the Metropolitan Telephone and Telegraph Company—has in place in ducts over 4,000 miles of wire, the greater portion of which, or nearly the greater portion of which—it may be a little less than one-half—are in actual operation and satisfactory operation. The distribution of these wires has been attended with no difficulty, and the actual operating so far of all of the subways for the purposes of the telephone and telegraph, except as indicated in the communication received from the Western Union Company, has been satisfactory in the highest degree. I think I am not overstating, but understating, when I make that statement.

"Criticism has been made as to the want of a distributing system. There are two answers to it.

"First. There has been no real need experienced by those who have used the subways, because, as I have stated in the instance of the telephone and telegraph companies, distribution has actually been made and used. The cables which are referred to in the communication of the Western Union Company as 'our distributing cables,' not the ones going across Park Row, but those going down town from Dey street,

have been used as distributing cables, and successfully used, and no criticism of any kind as to the entire usefulness of the subway has been made, except the Steam Heating Company leaks upon the subway. The construction across Park Row is a trunk line construction to carry the south-going lines of the Baltimore and Ohio and Western Union.

"Now, I referred to the one answer. The second answer is that as some question was raised by some of the electric light companies as to the excellence of the system for distribution—as to its fully performing what would be required of it for electric light purposes—the Consolidated Telegraph and Electrical Subway Company, at some expense to itself, has adopted the best system that there was known—the Johnstone system—and the same is now being put in actual use along Broadway at various points, and is intended to be put in use where the necessity may arise.

"This in answer to the suggestion that no distributing system has been adopted. It has been adopted by the Board of Electrical Control, approved by all the Engineers, the Engineer of the Board and our own Engineers, and all who have been called in, in respect to it, have testified to its great value. So that not only can the distribution be done by the methods that heretofore have been adopted, but there is now an actual system that will enable distribution to be made to each house along the route of the lines of wires.

"As to the character of the work, as to what the character of the work performed is, and what care the Consolidated Telegraph and Electrical Subway Company may be supposed to take of it, it will be borne in mind that it has been constructed entirely at its own risk, that every dollar expended is expended by the Company, and there is not any means of recuperating in the event of their failure.

"The suggestion has been made that the city is obliged to take the subways at the end of fifteen years. The city has an option to take it or not. If the money has been well expended the City of New York has reserved to itself the right at cost, with a slight enhancement for the investment, of retaking at the end of ten years the subways. In the meantime the risk is our own.

"I would say further, as an indication of the general character of the work, that every facility has been extended to the various city departments, the Fire and Police, from whom no pay is received; and I think the testimony of all engineers connected with all the public departments that are using the subways, and intend to use them, still further is that the subway is of the best construction, and that it is entirely satisfactory in every respect.

"And we have had no difficulty to encounter. We appreciated that no difficulty would arise except the one that has been referred to in the communication; and we appreciated that that difficulty might arise from the communication of our Engineer to me as President of the Company. It will be observed that a special care was taken in respect to the construction of the subway in the lower part of the city, near the Steam Heating Company's conduits; and the Engineer certifies—and, I think, that

is, too, the testimony of their own Engineer—that no better or better constructed conduits could be devised. They were removed as far as possible from the Steam Heating Company's pipes. They were put along a line, I think, $1\frac{1}{2}$ feet below the line of the steam heating conduits. Radiation from the steam heating conduits was absolutely impossible; and it needed simply proper care in construction and proper supervision after construction by the Steam Heating Company of their own conduits to make the subways in that part of the city as safe as in any other.

"It is the opinion of our Engineers that a proper construction by the Steam Heating Company would involve, as I have already suggested, the construction of manholes along the line of the Steam Heating Company precisely as the Subway Company there. This, first, in order to diminish immediately the effect of any leak, and, secondly, to enable repairs to be made.

"There have been interviews between Mr. Andrews and myself and the Engineers in respect to the steam heating problem, and I must admit that the position of the Engineer, who is here, and the position of Mr. Andrews have been—that the assertion is made that everything had been done by them as the law requires, as their charter requires, as the good of the community requires, to keep the steam heating pipes in absolutely perfect condition, and whenever a complaint has been made to them it has been followed by an effort to make the repair. But the difficulty seems to be after the repair is made that it is a long time before the temperature of the earth—it is so thoroughly baked—is decreased, and a recurrence is likely to occur. An explanation that was made by Mr. Andrews and, I think, by the Engineer was that, while the joining of their pipes has been done as perfectly as possible, it will yield, owing to the joint weight of the pavement above and the street, and that, in addition to that, there is a very great leakage of the Croton pipes, which are adjacent to the steam heating pipes, and that it is the dripping of the water upon the steam heating pipes from the Croton pipes that creates this great amount of heat. What there is in that, I do not know; and probably the representative of the Steam Heating Company can develop that better than I can."

President Hess: What observations have been made on the 58th street conduit, where there are steam heating pipes running parallel?

Mr. Lauterbach: No difficulty. The difficulty is confined to the lower part of the city altogether. The situation is one that deserves careful consideration. The Board of Electrical Control has built these subways, and we have been their servants and agents, and have done the work. We believe we have done the work as well as it could possibly be done and entirely satisfactory to all operating companies; and I believe there will be no criticism by the representative of the Steam Heating Company as to the character of our work or as to the complete scientific construction of the subways.

The Steam Heating Company exercises a privilege which is private in its character. The Board of Electrical Control and the Construction Company, under the Acts of the Legislature, are endeavoring to carry out a public requirement which the Legislature has declared as being necessary, and are engaged not only in a quasi public, but in an actual public work. I think that every effort ought to be made to make the operation of the business practical. I think that every effort ought to be made, not to institute any action by the Subway Company against the Steam Heating Company, or by the Board against the Steam Heating Company, until every effort has been exhausted to render the operation of their business safe. But if it shall be impossible, I believe it to be the duty of the Board or of the Company, at its suggestion—because we have assumed for the Board the task of protecting the subway's right—and assuming that duty it would be a question whether this duty that is exercised is to be interfered with by a private right.

Commissioner Gibbens: You are not the only people that are affected. Mr. Jones, of "The Times," said day before yesterday that his building was seriously endangered owing to the escape of steam in that neighborhood.

President Lauterbach:—That is the position. If we were both individuals it would be the duty of the Steam Heating Company to use its property as to do the least injury to our own. Both being corporations—the one of a private kind, and the other of a public kind—the obligation is infinitely greater than between individuals; and I think we have a right to expect such measures as will render a recurrence of the present condition absolutely impossible. If it be impossible for them so to construct their conduits as to secure the result, I think it would be the duty of this Company, acting under instructions of the Board, to test the question whether that should be maintained which would be in its character a nuisance even if the best methods of construction were adopted.

Whether this whole difficulty could not be avoided by a rebuilding of the steam heating conduits, the introduction of manholes, is a question which I am hardly able to discuss, but which will present itself to the Board, and they can consider the matter as they deem right.

I say on behalf of the Company, to sum up, that we have built in this section of the city, as in every other, the best subways that have been known, have constructed them in the best manner, have spared no expense or trouble in making the construction, have been ready to follow every suggestion that has been made by the Board or by the Companies which intended to use the subways, have met with adverse criticism and no difficulty, except the difficulty of the operation by a private company of a franchise which they have secured, and which, while it is their right to use, they have no privilege of abusing.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Tuesday, October 23d, 1888, at 12 o'clock M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The Board dispensed with the reading of the minutes of the last meeting.

Engineer Kearny, of the committee appointed at the meeting of October 17, 1888, to report upon the condition, &c., of the downtown subways, stated to the Board that the committee were not yet able to make a report, not having completed their examination.

The Board directed that the Engineer and the Expert of the Board be directed to consider these matters concerning the downtown subways referred to them, and make a specific report in writing as soon as possible.

Commissioner Gibbens, after stating that he had learned during the morning that the Mount Morris Electric Light Company had been erecting poles without the permission of the Board, moved the following resolution:

Resolved, That the Expert be directed to send the ordinary notice for the removal of poles to the Department of Public Works, and that the Mount Morris Electric Light Company be regarded as in contempt before this Board until it explains satisfactorily to the Board why it has erected poles without the permission of the Board.

Unanimously adopted.

The following communication was read:

EXECUTIVE OFFICES OF
THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,
No. 18 CORTLANDT STREET,
NEW YORK, October 20th, 1888.

The Honorable Board of Electrical Control, THEO. MOSS, Secretary:

GENTLEMEN:—With reference to the suggestion of your Electrical Expert that the following addition be made to the Rules and Regulations of this Company, viz.:

Electric Light Cables.

No two or more conductors having a difference of potential exceeding 500 volts shall be placed in the subway if made in a single cable. This applies to the outgoing and incoming sides of arc light circuits. I am directed to inform you that this Company considers the suggested addition a very desirable one, and with the approval of your Board will incorporate it in the Rules and Regulations governing the occupancy of subways.

Very respectfully yours,

WILLIAM J. SEFTON, Secretary.

Commissioner Gibbens offered the following resolution:

Resolved, That the communication of the Consolidated Telegraph and Electric Subway Company, dated October 20th, 1888, be spread on the minutes, and the regulation suggested as an addition to the Rules and Regulations governing the Occupancy of Subways, as follows:

Electric Light Cables.

No two or more conductors having a difference of potential exceeding 500 volts shall be placed in the subway if made in a single cable. This applies to the outgoing and incoming sides of arc light circuits, be approved by the Board.

Resolved, That the application of the United States Illuminating Company, dated October 23d, 1888, to place electric arc lamps and fixtures and connect same with circuit at the places therein designated is granted.

Unanimously adopted.

The Board thereupon considered the proposed rules and regulations for overhead conductors for electric light and power, and finished their reading.

Commissioner Gibbens offered the following resolution:

Resolved, That the proposed Rules and Regulations for overhead conductors for electric light and power lie over until the meeting of October 30th, 1888.

Unanimously adopted.

The Board thereupon, on motion of Commissioner Moss, adjourned.

OFFICE OF THE BOARD OF ELECTRICAL CONTROL,
1218 BROADWAY, NEW YORK.

OCTOBER 26th, 1888, 12 o'clock M.

The Secretary called the roll.

Present: Commissioners Daniel L. Gibbens and Theodore Moss.

Absent: Mayor Abram S. Hewitt and Commissioner Jacob Hess, President.

No quorum.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Tuesday, October 30th, 1888, at 12 M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The Board, on motion of Commissioner Moss, dispensed with the reading of the minutes.

The following communication was read:

MAYOR'S OFFICE,

NEW YORK, Oct. 27, 1888.

JACOB HESS, ESQ., President Board of Electrical Control:

SIR:—I transmit herewith a letter from John A. Gano, in reference to a safety cut-out for electric wires.

Yours respectfully,

ABRAM S. HEWITT, Mayor.

CINCINNATI, Oct. 25, '88.

HON. A. S. HEWITT, Mayor, N. Y. City:

HON'D SIR:—A recent account of accident from a dislodged electric wire prompts me to call attention of proper municipal authorities to the fact that there has been devised a safety cut-out to heavily charged electric wires which automatically shuts off the current on any wire to which it may be attached whenever such wire may be dislodged and become dangerous to inadvertent persons who may touch it.

The attention of the Brush E. Co. has been called to the invention, yet its managers appear to be indifferent and reckless.

I write this to suggest enquiry as to whether the B. Co. and any other Co. that may have authority to string dangerous wires should not be required to afford the protection that the device referred to or any other effective one proposes in all instances where they enjoy public franchises.

The device referred to has been tested effectively and works well. It is simple, easily applied and not expensive.

Most respectfully,

JOHN A. GANO.

Commissioner Gibbens offered the following resolutions:

Resolved, That the letter from Mr. John A. Gano be referred to the Expert of the Commission to investigate the safety cut-out and report at the meeting of the Board to be held a week from Friday, and that the Mayor be notified of such reference.

Unanimously adopted.

Resolved, That the application of the Brush Electric Illuminating Company, dated October 29th, 1888, to connect electric lamps with their circuits at Madison Square Garden, Fourth avenue, Madison avenue, 26th and 27th streets, 845 Broadway, 497 Broadway, Standard Theatre, Broadway and 33d street, 759 Broadway, be granted.

Unanimously adopted.

Resolved, That the application of the East River Electric Light Company, dated October 29, 1888, to hang lamps and connect same with circuits at 164 Second avenue, 69 Sixth avenue, 1435 Third avenue, 289 Avenue A, be granted.

Unanimously adopted.

The following application was read:

THE UNITED STATES ILLUMINATING CO.,
59 & 61 LIBERTY STREET,
NEW YORK, October 24, 1888.

THEODORE MOSS, ESQ., Secretary Board of Electrical Control:

SIR:—Permission is requested by the United States Illuminating Company to erect a new support pole in place of the old one at No. 1311 Broadway.

This pole was fractured by the Bureau of Incumbrances while taking down the old Manhattan Company pole line.

This pole if guyed to the building opposite would be rendered safe.

Respectfully yours,

A. E. SCOULLAD, Supt.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Secretary be directed to inform the United States Illuminating Company that no permit will be granted for repairs, alterations or construction in the district where the wires of the Company have been ordered underground, where the Mayor has been requested to remove them; and also that he direct the President of the United States Illuminating Company to remove the pole at No. 1311 Broadway, which is very dangerous, immediately.

Adopted. Vote: Commissioners Gibbens and Moss, "aye"; President Hess, "no."

Resolved, That the application of the United States Illuminating Company, dated October 24, 1888, to erect a new support pole in place of the old one at No. 259 Bowery be granted.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated October 27, 1888, to erect a new support pole in place of the old one at No. 338 Washington street be granted.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated October 27th, 1888, to place an arc lamp at 1278 Third avenue and connect same with circuit be granted.

Unanimously adopted.

Resolved, That the application of the Harlem Lighting Company, dated October 24, 1888, to hang one arc lamp at No. 213 East 124th street and to do the other acts therein specified, be granted.

Unanimously adopted.

Resolved, That the two applications of the Ball Electrical Illuminating Company, dated respectively October 2, 1888, and October 4, 1888, to stretch wires over routes therein indicated, be laid on the table.

Unanimously adopted.

The following application and communication from the Mount Morris Electric Light Company were read:

NEW YORK, Oct. 25, 1888.

To the Honorable the Board of Electrical Control, 30th St. and Broadway, N. Y.:

Permits are requested by The Mount Morris Electric Light Company to erect poles and string wires from Ninth avenue to Tenth avenue on 53d street to reach commercial light at that point, viz.: Tenth avenue and 53d street.

Respectfully,

EDWARD MAY, President.

NEW YORK, Oct. 25, 1888.

To the Honorable the Board of Electrical Control, 30th St. and Broadway, N. Y.:

Permits are requested by the Mount Morris Electric Light Company to erect poles and string wires upon the following streets and avenues:

On Manhattan street from 125th St. to Grand Boulevard,

On St. Nicholas Ave. from 122d to 125th St.

On the Grand Boulevard from 110th to 155th St.,

On 135th St., 6th to 8th avenues,

On 110th St., 6th to 8th avenues,

On 110th St., 9th Ave. to Grand Boulevard.

Very respectfully,

EDWARD MAY, President.

NEW YORK, Oct. 25th, 1888.

THEODORE MOSS, ESQ., Sec'y the Board of Electrical Control, Broadway & 30th St., City:

DEAR SIR:—We regret to notice in the public press that your Board, at its last meeting, declared that the Mount Morris Electric Light Co. were in contempt of your Board by reason of having set poles without its permission.

In order that we may correct the impression, which your Board has derived, undoubtedly from reports of competing companies, we desire to say that no new work has been done by our Company except by authority of permits received from your Honorable Body.

Since the receipt of your communication of Sept. 19th, announcing the rescinding of the resolution theretofore granted by your Board, giving us authority to put up poles, no new work has been done by us in any portion of the City.

We have, on Lenox avenue, at the request of the Park Department and the Department of Public Works, in order that the trees on that street might not be injured by contact with our wires, substituted at very great expense high poles in place of the ordinary poles, which we at first placed there, and which poles had been approved by your Board.

No new excavations have been made, nor any new wire strung, and we are quite satisfied with this explanation upon our part that you will take such action as is proper under the circumstances to relieve us from the unjust imputation of having intentionally violated the rules of your Board, which we have always tried studiously to observe in every particular.

Yours very respectfully,

THE MOUNT MORRIS ELECTRIC LIGHT CO.,

EDWARD MAY, Prest.

Commissioner Gibbens moved the following resolution:

Resolved, That the two applications of the Mount Morris Electric Light Company, dated respectively October 25, 1888, be laid on the table.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated October 30th, 1888, to make connections with circuit for the purpose of serving customers with electric light at 327 Broadway and East Broadway, corner of Jefferson street, be granted.

Unanimously adopted.

The application of the Electric Power Company, laid over from a previous meeting, was brought up, and, after some discussion, Commissioner Moss moved the following resolution:

Resolved, That the application of the Electric Power Company be laid over until the Company produces a written permission to string its wires on existing poles of other companies.

Unanimously adopted.

The following communication was read and ordered to be spread on the minutes:

NEW YORK, Oct. 25th, 1888.

To the Honorable the Board of Electrical Control, No. 1218 Broadway, City:

GENTLEMEN:—In acknowledging receipt of your letter of the 24th of October, we beg to state that we have removed the wire referred to.

Yours respectfully,

THE HARLEM LIGHTING CO.,

Per ABRAM C. BERNHEIM.

The following report was presented to the Board and read:

NEW YORK, Oct. 30, 1888.

To the Honorable the Commissioners of the Board of Electrical Control:

GENTLEMEN:—In accordance with your resolution calling upon your Engineer and Electrical Expert to ascertain the facts in connection with the steam heating trouble on lower Broadway, we have to report as follows:

The sole cause of trouble is the heat caused by the escaping steam from the pipes of the Steam Heating Company. This brings the temperature of the conduits up to a point which none of the cables as ordinarily made for underground work can stand, and it is doubtful if any practicable cable can be made which will stand these high temperatures and at the same time be waterproof.

All of the substance used as insulation in making waterproof cable are organic compounds which either melt at a low temperature or become soft at a lower temperature, in which case they both deteriorate as insulators and run or drip off of the wires as well. Or they become charred or burnt and thus lose their insulating properties and crumble or drop off the wires.

In order to avoid all these materials which are rendered useless by the heat met with, we decide to inquire into the probable chances of success of a cable covered with some woven fabric but left dry, that is, not treated with any fusible substances such as wax or rubber, relying upon a lead pipe covering to keep the water out. We found that precisely such a cable has been laid by the Telephone Company across Broadway at Ann street, where a high degree of heat was met, but unfortunately this has not been put in use yet and we were not able to get at its results.

The Telegraph Company laid a similar cable about two years ago which gave out, but the cotton had been treated with some substance which may have impaired it, and the lead covering was injured enough to admit water.

These are the only two cases we could find of efforts having been made to make cables which would stand this new heat and unfortunately neither of these can be used as a criterion.

The remedy is unquestionably with the Steam Company in stopping the leaks. The problem of making a cable to stand the heat is one of great difficulty and uncertainty as to the results, if it is possible at all. The heat caused by the steam leakage on Broadway was so great at the time the cable spoken of was laid, two years ago, that it expanded the brass pneumatic dispatch tubes of the Western Union Telegraph Company and crushed their ends against the brick junction boxes.

A lead covering for cables will carry off some of the heat at first, and in some cases where the heating is temporary or local such a covering will be sufficient protection. We made inquiry as to the effect of the heat upon the numerous cables of the Telephone Company which are laid parallel with those of the Telegraph Company destroyed by the heat, with the view of ascertaining if possible whether the trouble could be due to the use of old or poor quality of cable by the Telegraph Company. We found that the Telephone cables have not been put in use yet owing to the incompletion of their new offices, but they volunteered to make tests at once and let us know the results. We have just received a letter from them which is submitted herewith, showing that their cables have deteriorated.

Very respectfully,

HENRY S. KEARNY, Chief Engineer to the Board.

SCHUYLER S. WHEELER, Electrical Expert to the Board.

OFFICE OF THE GENERAL MANAGER OF
THE METROPOLITAN TELEPHONE AND TELEGRAPH COMPANY,
18 CORTLANDT STREET,

NEW YORK, Oct. 26, 1888.

S. S. WHEELER, ESQ., Electrical Expert, Board of Electrical Control, 1218 Broadway

DEAR SIR:—In accordance with your request of yesterday and in answer to your enquiry as to what injury the steam pipes in Broadway, south of Cortlandt street, were doing our underground cables, I beg to report that our electricians made a test yesterday afternoon and his report shows a very considerable deterioration in the insulation since they were laid, which is owing to the high temperature caused by the steam pipes in Broadway.

Respectfully,

W. H. ECKERT, Gen'l M'gr.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be instructed and directed to take immediate measures to prevent the escape of steam from the pipes of the New York Steam Heating Company, in such manner as the Consolidated Telegraph and Electrical Subway Company may find to be best, either by

instituting an action for damages against the New York Steam Heating Company, or by getting an injunction against it, or in some other way.

Unanimously adopted.

Resolved, That the applications of the Western Union Telegraph Company, dated respectively October 4, 1888, and October 15, 1888, to string cables as therein indicated, be laid over until next Friday.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated October 30th, 1888, to place an electric arc lamp and connect same with circuit at New York Herald Building, corner of Broadway and Ann street, be granted.

Unanimously adopted.

The following communication and report thereon were read:

NEW YORK, Oct. 23d, 1888.

HON. THEO. MOSS, Sec'y:

DEAR SIR:—You have asked me to submit to you the territory covered by the wires of the Ball Electrical Ill. Co., which is as follows: Beginning at station No. 131 W. 38th St., we have two parallel wires running south as far as 35th St. and Broadway and two parallel wires running north as far as 42d street and Broadway, one loop running from said lines to Seventh and 36th St., and another loop crossing Broadway and 39th St. from southwest to northwest corner; another loop from Broadway crossing Seventh avenue at 42d street to southwest corner of 42d St.; all housetop lines.

Yours respectfully,

ROBT G. REILLY, Mgr.

I find these wires existing as described in the above report, except that in some instances they rest on Brush and U. S. poles, for short distances, near the lamps.

Wires crossing housetop 134 W. 38th St. require to be raised.

Useless fixture at S. W. corner 40th St. & B'way.

Bare spot on wire on pole S. E. cor. Met. Opera House.

C. P. REILLY, Inspector.

Commissioner Gibbens offered the following resolution:

Resolved, That the communication of the Ball Electrical Illuminating Company, dated October 23, 1888, giving territory covered by its wires, and the report of the inspector thereon, be spread on the minutes, and that notice be sent to the Company to comply with the rules and regulations of the Board immediately in the cases of violations thereof reported.

Unanimously adopted.

The following communication was read:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,
NO. 18 CORTLANDT STREET,
NEW YORK, N. Y., October 25th, 1888.

To the Honorable the Commissioners of the Board of Electrical Control, HON. JACOB
HESS, President, 1218 Broadway, N. Y.:

GENTLEMEN:—We herewith beg leave to submit for your approval and authorization an electrical subway for telephone and telegraph purposes on Franklin Square, between Dover and Chambers streets, for construction during the present season, and for which we ask your favorable consideration. Construction, iron pipe laid in hydraulic cement concrete. This short line will connect two existing lines of subway and is designed to meet the requirements of the Metropolitan Telephone and Telegraph Company. The map showing the location of the above line is submitted herewith.

Very respectfully,

EDWARD LAUTERBACH, President.

Engineer Kearny stated to the Board that the application of the Consolidated Telegraph and Electrical Subway Company had its approval.

Commissioner Moss moved the following resolution:

Resolved, That the Board authorize and approve the construction by the Consolidated Telegraph and Electrical Subway Company of an electrical subway for telephone and telegraph purposes on Franklin Square, between Dover and Chambers streets, as outlined in its application to the Board, dated October 25, 1888.

Unanimously adopted.

Adjourned.

OFFICE OF THE BOARD OF ELECTRICAL CONTROL,
1218 BROADWAY, NEW YORK,
November 2d, 1888, 12 o'clock M.

The Secretary called the roll.

Present: Commissioners Daniel L. Gibbens and Theodore Moss.

Absent: Mayor Abram S. Hewitt and Commissioner Jacob Hess, President.

No quorum.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Tuesday, November 13th, 1888, at 12 o'clock M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of last meeting were read and approved.

The Board took up the consideration of the proposed Rules and Regulations for Overhead Conductors for Electric Light and Power. After their reading, together with various proposed amendments and additions, Commissioner Gibbens offered the following resolution:

Resolved, That the Rules and Regulations for Overhead Conductors for Electric Light and Power as read be adopted by the Board, the Secretary be directed to have printed copies made of them, they be sent to the different electric light and power companies, and that they take effect on Monday, November 19th, 1888, when applications for permits under them will be in order.

Unanimously adopted.

The Rules and Regulations for Overhead Conductors for Electric Light and Power as read and adopted are as follows:

OFFICE OF
THE BOARD OF ELECTRICAL CONTROL,
1218 BROADWAY, N. Y.

RULES AND REGULATIONS FOR OVERHEAD CONDUCTORS FOR ELECTRIC LIGHT AND POWER.

I. No two lines of poles bearing conductors of a like class shall be erected on any street or avenue.

II. No two lines of poles shall be erected on the same side of any street or avenue.

III. Poles shall be set in the sidewalk twelve inches from the outside of curb, and no pole shall be placed within ten feet of any lamp post or other pole, except at street corners where necessary in order to support wires running on the cross street.

IV. All poles now standing, or to be hereafter erected, shall be branded or stamped with the initials of the company owning them, at a point not less than five nor more than seven feet from the street surface; and when a pole is occupied by wires belonging to more than one company, each group of cross-arms, or where necessary the support of a single wire of different ownership, must be distinguished by some characteristic paint, mark or fastening.

V. Electric light lamp posts shall be in accordance with the plan adopted by the Board.

VI. All poles erected for the purpose of carrying lines of more than two electric light or power wires shall be at least forty-five feet high, uniform in size, straight, and painted from top to bottom—a very dark color from the sidewalk to a point eight feet high, and a dark green color above that.

VII. All poles for carrying not more than two electric light wires shall be twenty-five feet high, straight, uniform in size, and painted from top to bottom—a very dark color from the sidewalk to a point eight feet high, and a dark green color above that.

VIII. Cross-arms shall be uniform in length, strengthened by braces, and painted the same color as the poles—the cross-arms of each company being distinguished by some characteristic mark.

IX. Each line of poles must be run on one side of the street only, except when absolutely necessary to change to the other side; but this may only be done by the permission of the Board of its Engineer or Expert.

X. Electric light conductors must not be placed upon fixtures erected or maintained for supporting wires of the other class, namely, those for signalling, except by permission of the Board.

XI. Poles shall be uniformly spaced, at about sixty to the mile. This requires on the short city blocks of two hundred and sixty feet, alternately three and two poles to the block.

XII. All conductors shall be secured to insulating fastenings, and covered with an insulation which is water-proof on the outside and not easily worn by abrasion. Whenever the insulation becomes impaired it must be renewed immediately.

XIII. No wire shall be stretched within four inches of any pole, building or other object, without being attached to it and insulated therefrom.

XIV. Every wire must be distinguished by a number plainly marked on each cross-arm under the insulator.

XV. No unused loops from electric light circuits shall be allowed to remain after lamps are taken away, except in cases where it is positively known that the lamp will be required again within three months, and where there is no underground conduit for that class of circuits.

XVI. All arc lamps must be so placed as to leave a space underneath of nine (9) feet clear between lamp and sidewalk.

XVII. All wires must be stretched tightly and fastened to glass or porcelain insulators, approved by the Expert, with a strap of the same kind of wire.

XVIII. All connections with lines of electric light conductors shall be made at right angles to the same; and connections to buildings shall be run straight across to the building, and then down the front of the building.

XIX. All joints must be as well insulated as the conductors, and the insulation of joints must be maintained.

XX. Every line entering a building shall be controlled by a cut-out placed near the entrance, in sight, and easily accessible.

XXI. No wires shall hang within twenty feet of the pavement at the lowest point of sag between supports.

XXII. In the construction of lines the insulation to be used must be approved by the Expert of the Board in writing, and the insulation resistance must be maintained in accordance with a standard to be not less than 1-20 megohms per mile per hundred volts. And under no circumstances shall Underwriters' wire be used.

XXIII. All circuits must be tested every hour, and when a ground comes on, efforts must be made to remove it at once; failing in this, the current must be discontinued until the insulation is restored.

XXIV. The insulation must be preserved throughout the entire circuit, and if any portion of a lamp or fixture is a part of the circuit and can be touched, it must be insulated.

XXV. All conductors shall have a resistance uniformly distributed of not more than 1-10 ohm. per mile per ampere, and proportionately less for heavier currents.

XXVI. All existing regulations of the local authorities in regard to the placing of poles and stringing of wires are to continue in force, except when in conflict with the rules; and the rules and regulations of the New York Board of Fire Underwriters must be strictly observed.

XXVII. The violation of any of the rules and regulations of the Board shall operate ipso facto as a revocation of the permit held by the company or person guilty of such violation.

XXVIII. Whenever hereafter any company shall be permitted by this Board, or its successors, to erect posts or poles, or other fixtures bearing lamps or other devices, for the purpose of lighting by electricity the streets, avenues, highways, parks or public places of the city, the said permission shall be granted only subject to the following provisions, and the same is hereby expressly made a condition of said permits. At any time when, by action of the city authorities, the contract for lighting any such street or other public place shall be given to another company, the company erecting said lamp-posts shall, on tender of the first cost thereof, yield possession and ownership of the same to the said other company obtaining the new contract, except in a case where the company owning the lamp-posts prefers to remove them.

XXIX. All broken and "dead" wires, and all wires, poles and fixtures not actually in use—subject to Rule XV.—must be removed from the streets, avenues and highways of the city. When an old pole is taken down it must be removed from the streets the same day. New poles must not be brought upon any street more than two days in advance of their erection. Any pole that shall lie on any street more than two days shall be removed by the Bureau of Incumbrances of the Department of Public Works, at the expense of the party owning it.

XXX. From and after the first of _____ no company shall do business of arc electric lighting in the city of New York without a certificate of the Board, granted on the recommendation and after inspection by the Expert of the Board, to the effect that its lines comply with all the Rules and Regulations of the Board, and that its plant is in proper condition for the doing of its business. The force of the certificate to continue until changes are made, of which the Board must be notified and approve, or so long as the plant and conductors remain in the same condition as when inspected.

XXXI. Every lineman must wear a badge in a conspicuous place, giving his number and the name of the company by whom he is employed.

XXXII. All permits of the Board for overhead wires and fixtures are granted only pending the providing of underground accommodations in the neighborhood of the street or avenue for which the permit is granted.

XXXIII. Any member or officer of the Board, and every inspector employed by it, as well as every member of the police force of the city, shall be entitled to examine permits under which work of any kind is being done.

XXXIV. No permit shall be granted for the erection of any overhead structure nor for the renewing of any lines already existing in any street, avenue or highway in which underground accommodations for the service have been provided, or are being provided.

XXXV. Every line, pole, fixture, etc., must be kept in thorough order, repair, and conformity with these rules and specifications, upon penalty of forfeiture of all permits granted to the owner by this Board.

But the general permit under which these repairs are to be made does not cover the erection in any street, avenue or highway of any new poles or other similar fixtures, and has absolutely no reference whatever to lines which have been ordered underground by the Board, and which the Mayor has been requested to remove.

In the case of such lines, where notice has been given that underground accommodations have been provided, and the ninety days of notice required by law have elapsed, and the Mayor has been requested to remove the same, companies owning or operating said lines are not authorized to make any repairs or connections or to go upon the poles bearing such lines for any purpose whatever, except to remove the said lines of electrical conductors in conformity with the directions of the Board.

Any deviation from this rule requires a resolution passed at a regular meeting of the Board, attested by the Secretary.

XXXVI. Every company or person erecting poles, wires or fixtures must make and leave, at least once each week, such records at the office of the Board, of the fixtures, etc., which they are erecting, and of all of the same that they have in use, as are required by the Engineer and the Electrical Expert of the Board, and in such form as shall be prescribed by them.

XXXVII. The companies or persons owning or controlling poles in any street or avenue, erected under permits of this Board or the Board of Electrical Subways, shall allow the same to be used by other companies or persons operating conductors for similar electrical service when authorized so to do by the Board, on tender of proper compensation, to be determined by agreement between the parties interested. In default of such an agreement the amount of such compensation shall be determined by the Board. This rule imports a contract on the part of each company or person owning or controlling the poles on any street or avenue, not only with the Board but also with each company or person who shall under its terms be qualified to demand the privileges it confers, to permit this joint use of poles.

And in accepting any permit the applicant thereby binds himself to this agreement.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Secretary be directed to return the application of the Commercial Telegram Company, dated November 1, 1888, with a request that the Company furnish the Board with the route of the wires desired to be strung, and stating how it desires to support them.

Unanimously adopted.

Resolved, That the application of the Ball Electrical Illuminating Company, dated October 2, 1888, to stretch two wires across Broadway at 39th Street, from southwest to northwest corner, be denied.

Unanimously adopted.

Commissioner Moss moved the following resolution:

Resolved: That the application of the Ball Electrical Illuminating Company, dated October 4, 1888, to run wires on poles of Mount Morris Electric Light Company, over route therein specified, be laid over until next Tuesday.

Unanimously adopted.

Commissioner Gibbens moved the following resolutions:

Resolved, That the application of the United States Illuminating Company, dated November 13, 1888, to connect lamp with circuit at No. 2 Maiden Lane, be granted.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated November 7, 1888, for permission to run wires over routes therein indicated, be returned to that Company by the Secretary with the information that the Board would be very glad to grant permission to the Company to string wires where they have poles, provided it would comply with the regulations of the Board in relation to placing their wires underground in streets where there are subways, and not otherwise.

Adopted. Vote: Commissioners Gibbens and Moss "aye"; Commissioner Hess "no."

Resolved, That the application of the Western Union Telegraph Company, dated November 9, 1888, to set poles at points therein specified to replace rotten and dangerous ones, be granted.

Unanimously adopted.

Resolved, That the applications of the Western Union Telegraph Company, dated respectively October 4, 1888, and October 15, 1888, be granted;—the application dated October 15 being first made to read "two 50-conductor cables" instead of "five

50-conductor cables"—the wires to be strung on existing poles, and the applications being granted only pending the providing of proper underground accommodations in the vicinity.

Unanimously adopted.

Resolved, That the application of the Brush Electric Illuminating Company, dated November 8, 1888, to connect electric lamps with circuits at certain places therein mentioned, be granted.

Unanimously adopted.

Resolved, That the application of the East River Electric Light Company, dated November 7, 1888, to hang lamps and connect same with circuits at places therein designated, be granted.

Unanimously adopted.

Resolved, That the applications of the United States Illuminating Company, dated respectively November 3, 1888, November 3, 1888, November 5, 1888, November 7, 1888, November 8, 1888, November 9, 1888, November 12, 1888, to connect lamps with circuits, be granted.

Unanimously adopted.

The following communication was read:

THE UNITED STATES ILLUMINATING Co.,
59 and 61 LIBERTY STREET.
NEW YORK, Nov. 8, 1888.

THEODORE MOSS, Esq., Secretary Board of Electrical Control.

SIR: Before issuing a permit to the United States Illuminating Company to erect new support poles in place of the old ones the Board of Public Works requires a certified copy of your permit for the same.

Please send me a copy of permit for 281, 274 and 289 South street as soon as possible and oblige,

Respectfully yours,

A. E. SCOULLAD, Supt.

The Secretary stated that the request contained in the communication of the United States Illuminating Company had been complied with.

Commissioner Gibbens offered the following resolutions:

Resolved, That the application of the North New York Lighting Company, dated November 13, 1888, to reset pole at 134th street and Third avenue, and to erect thirty poles on Third avenue from 164th to 170th streets, be laid on the table.

Unanimously adopted.

Resolved, That the application of the East River Electric Light Company, dated November 1, 1888, to erect poles for electric light wires on Sixth avenue, between 32d and 59th streets, to enable it to complete contract with the city for street lighting, be laid over.

Unanimously adopted.

Resolved, That the President of the Board be appointed a committee to wait on Mayor-elect Hugh J. Grant and tender him the congratulations of the members of the Board upon his election and his magnificent majority, and to assure Mr. Grant that we will be delighted to have him attend at any meeting of the Board which he may see fit, or meet the members of the Board at any time he may designate, in order to become fully acquainted with the work of the Board and the nature of the duties he will have to perform as a member of the Board.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Whereas, in the opinion of this Board a sufficient construction of conduits or subways underground has been made ready, reference being had to the general direction and vicinity of the electrical conductors in use overhead in the following streets and localities of the city, to wit:

For Telephone and Telegraph Conductors:

- Broadway, from Bowling Green to 58th street.
- New Church street, from Exchange Alley to Barclay street.
- Barclay street, from Church street to College place.
- College place, from Barclay to Chambers streets.
- West Broadway, from Chambers to Canal streets.
- South Fifth avenue, from Canal to Fourth streets.
- Fourth street, from South Fifth avenue to Sixth avenue.
- Sixth avenue, from Fourth to Fifty-eighth streets.
- Eighth avenue, from Forty-second to Fifty-eighth streets.
- Madison avenue, from Twenty-third to Fifty-ninth streets.
- Lexington avenue, from Fifty-eighth to Sixty-fifth streets.
- Spring street, from Broadway to West street.
- Houston street, from Broadway to Chrystie street.
- Houston street, from Green to Bedford streets.
- Eighteenth street, from First to Seventh avenues.
- Twenty-third street, from Broadway to Madison avenue.
- Thirty-eighth street, from Lexington to Sixth avenues, and Broadway to Eighth avenue.
- Forty-second street, from Broadway to Madison avenue.
- Forty-fifth street, from Vanderbilt to Fifth avenues, and Fifth to Sixth avenues.
- Fifty-eighth street, from Third to Eighth avenues.
- Battery place, from Greenwich street to Bowling Green, along Bowling Green to Whitehall street, along Whitehall to Pearl street.
- Stone street, from Whitehall street to Hanover Square.
- Broad street, from Water street to Exchange place, through Exchange place from Broad to New Church streets.

William street, from Exchange place to Front street, along Front to Gouverneur street.

Pearl street, from Hanover Square to Dover street.

Maiden lane, from Front street to Broadway and Cortlandt, along Cortlandt to West street.

John street, from Nassau to Front streets.

Nassau street, from John to Ann streets, along Ann to Gold street, along Gold to Beekman street.

Frankfort street, from Park place to Pearl street.

Park row, from Ann to New Chambers streets.

Centre street, from Duane to Worth streets, along Worth to Chatham Square and New Bowery, and along New Bowery to Chambers street.

For Arc Light and Power Conductors:

Sixth avenue, from Eighteenth to Fifty-ninth streets.

Broadway, from Fourteenth to Fifty-eighth streets.

Nineteenth street, from Broadway to Fifth avenue, and from Fifth to Sixth avenues.

Twenty-first street, from Broadway to Fifth avenue.

Twenty-third street, from Fourth to Sixth avenues.

Twenty-fourth street, from Broadway to Sixth avenue.

Twenty-fifth street, from Broadway to Sixth avenue.

Twenty-sixth street, from Broadway to Sixth avenue.

Twenty-seventh street, from Madison avenue to Broadway, and Broadway to Sixth avenue.

Twenty-eighth street, from Broadway to Sixth avenue.

125th street, from Fifth to Eighth avenues.

Therefore be it Resolved, That the Secretary be directed to notify the owners or operators of the electrical conductors above ground in such streets or localities to make such electrical connections in said streets with such underground conduits or subways as may be necessary to the proper transaction of their business, and to place electrical conductors for the transaction of their business in the said conduits, and to remove poles, wires or other electrical conductors above ground and their supporting fixtures, or other devices, from the said streets and localities within ninety days after the receipt of this notice. And said companies are further notified to submit plans of said electrical connections hereby authorized, together with modifications of or additions to said conduits necessary, or deemed so to be, for making the same, to this Board, within ten days, or as soon thereafter as possible, so that this Board may cause the said modifications or additions to be made, if they appear to be proper and necessary; and, in case the said suggestions for the modification of or additions to said conduits are not submitted to the Board, or do not appear to the Board to be proper and necessary, the following methods are designated by the Board for the making of the said electrical connections in the said streets: For electric light and power conductors, subsidiary iron tubes from the nearest manhole in said subway to the point desired to be reached, and through said iron tubes insulated wires or cables connecting the lights, machinery or termini of overhead lines with electrical conductors in the said conduits. For other service, subsidiary pipes or boxes either of

wood or iron, extending from the nearest manhole to the point desired to be reached, with insulated conductors connecting the instruments or termini of overhead routes with the wires in the said conduits. The Consolidated Telegraph and Electrical Subway Company is authorized and directed to construct said subsidiary ducts or boxes, at such places as shall be desired by companies notified to use the subways as above, upon the application of such companies.

Unanimously adopted.

The following communication from the United States Illuminating Company was read:

NEW YORK, Oct. 30th, 1888.

To the Honorable Board of Electrical Control, 1218 Broadway, New York:

GENTLEMEN:—I am informed that at a public meeting of your Board held this day one Nicholas O'Connor, representing the Electric Power Company, declared that the United States Illuminating Company had given the Electric Power Company a permit, (which he would produce at your next meeting), to string wires on our poles on the streets named in their application to you, viz.:

"From South Fifth avenue, along Bleecker st, to Bowery, Bowery to Canal, Canal to South Fifth avenue, South Fifth avenue north to Bleecker st.

"Grand st., from South Fifth avenue to Bowery.

"Broome st., from Bowery to South Fifth avenue.

"Spring st., from South Fifth avenue to Bowery.

"Houston st., from Bowery to South Fifth avenue."

I have therefore to notify your Board that on a number of said streets this Company has no pole lines, and that for none of said streets has this Company given or promised Nicholas O'Connor or the Electric Power Company, or any other party, any such permit; moreover, no application whatever has been made to this Company for any such permit. We have the honor to be,

Very respectfully yours,

E. T. LYNCH, Pres.

Commissioner Gibbens—In connection with this communication of the United States Illuminating Company, I desire to say that Mr. O'Connor since the meeting of the Board has explained to me that he was acting as the Counsel for the **Electric Power Company**, that he was informed by his client that the **United States Illuminating Company** had given such a permit, and that he had no intention of deceiving the Board, but was deceived himself.

The Board ordered the statement of Commissioner Gibbens to go upon the minutes.

The following communication from the Consolidated Telegraph and Electrical Subway Company was read:

NEW YORK, November, 8th, 1888.

To the Honorable, the Commissioners of the Board of Electrical Control, Hon. JACOB HESS, President, 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith beg leave to submit for your approval and authorization the following lines of electrical subways for construction during the present season, and for which we ask your favorable consideration:

First. Crossings on Broadway at 25th street, 26th street, 27th street, 30th street, for telephone and telegraph service. The construction to consist of wrought iron pipe laid in hydraulic cement concrete, terminating in small manholes or flush boxes, whence the subsidiary iron pipe will issue for distribution. The above crossings are rendered necessary at this time by the application of the Western Union Telegraph Company for connections at the above points.

Second. A crossing for the Edison Electric Illuminating Company on 4th avenue at 23d street.

A line of electric light subway on the north side of 44th street, from Madison to 5th avenues, for the Edison Electric Illuminating Company.

The maps showing the location of the above lines are submitted herewith.

Very respectfully,

EDWARD LAUTERBACH, President.

Engineer Kearny stated to the Board that the application of the Consolidated Telegraph and Electrical Subway Company had his approval.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Consolidated Telegraph and Electrical Subway Company, dated November 8, 1888, for approval and authorization of construction of certain electrical subways therein indicated, be granted, and that the Company be directed to complete its work according to the plans on file in the office of the Commission.

Unanimously adopted.

Mr. Cohen, representing the Consolidated Telegraph and Electrical Subway Company stated to the Board as follows:

"In regard to the Counsel for the Consolidated Telegraph and Electrical Subway Company taking legal proceedings to enjoin the Steam Heating Company, we have examined the question, and there is not any doubt but that the right exists to enjoin that Company. The only question is as to the most proper party to take the step—the Construction Company or the City. We have put ourselves in communication with the Counsel to the Corporation, and are going to confer with him about who shall be the party plaintiff; and the Corporation Counsel suggests that a communication be

sent to him from your Board calling his attention to the condition of affairs, and asking that such steps be taken as will be most advisable against the Steam Heating Company."

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to communicate to the Counsel to the Corporation the state of facts—the detriment to the city which is resultant from the escape of the steam from the pipes of the Steam Heating Company—and request his co-operation.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the offices of the Board, in the City of New York, on Friday, November 23d, 1888, at 12 o'clock M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of the previous meeting were read and approved.

Hon. Nicholas R. O'Connor, representing the Electric Power Company, read a letter from the United States Illuminating Company to the Secretary of the Electric Power Company showing an understanding between these two companies by which the latter company were permitted to run their wires on the poles of the former, and a letter from the Metropolitan Telegraph and Telephone Company to the Secretary of the said Electric Power Company of similar purport, and in connection therewith made a statement to the Board qualifying a statement made by him at a previous meeting of the Board.

The following communication was read:

NEW YORK, Nov. 22nd, 1888.

DEAR SIR:—We acknowledge herewith receipt of your letter of the 16th inst., advising us of the streets in which subways are now ready and of the resolution of your honorable Board concerning their use.

We have already been in correspondence with several wire companies for the manufacture of a cable adapted to conduits, and take pleasure in informing you in detail of our course.

We have requested no less than eight companies to furnish us with their estimate of the cable laid in conduits about a mile in length. We propose to place an order for four or five different kinds of cable varying in length, so as to make a

practical test of the superiority and efficacy of the various cables, and then in the future, after our test is completed, to order such cable as it may demonstrate to be best.

Respectfully,

THE MANHATTAN ELECTRIC LIGHT COMPANY,

Per ABRAM BERNHEIM.

To the HON. THEODORE MOSS

The following application of the Consolidated Telegraph and Electrical Subway Company was read:

NEW YORK, N. Y., November 23d, 1888.

To the Honorable, The Commissioners of the Board of Electrical Control, HON. JACOB HESS, President, 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith beg leave to submit for your approval and authorization the following lines of electrical subways for construction during the present season, and for which we ask your favorable consideration, viz.:

On Dey street, from Broadway to Church street. To be built of wrought iron pipe laid in hydraulic cement concrete. This line is requested for the pressing accommodation of the Western Union Telegraph Company, and it is desired to construct it without delay before the season closes.

The map showing the location of the above line is submitted herewith.

Very respectfully,

EDWARD LAUTERBACH, President.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Consolidated Telegraph and Electrical Subway Company, dated November 23d, 1888, for approval and authorization of a subway for construction on Dey street, from Broadway to Church street, in accordance with the plan submitted, be granted.

Unanimously adopted.

The Board directed that the Secretary answer a communication of the Garfield Safe Deposit Company, dated November 16, 1888, in relation to the stretching of a wire, and send that Company a blank application and ask it to state therein what poles, if any, it proposes to use in stretching this wire.

The following report of Inspector George W. Roth was read:

NEW YORK, Nov. 23d, 1888.

S. S. WHEELER, Esq., Electrical Expert:

The following is my report of inspection of the three lines of poles, the property of the Western Union Telegraph Company:

Through 46th street, from Broadway to Sixth avenue, two poles; lines, one a working line, the other consists of six dead poles.

From Sixth avenue to Fifth avenue three lines of poles. Two are working and the other line dead. Four dead poles.

From Fifth avenue to Madison avenue are two working lines.

From Fourth avenue to Third avenue two lines of poles. The B. & O. has sixteen spare pins, and the other pole line has only four working wires.

Respectfully,

G. W. ROTH, Inspector.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to communicate with the Western Union Telegraph Company and request it to take down the poles on two of its lines in 46th street immediately.

Unanimously adopted.

Commissioner Gibbens—There are quite a number of applications here from different companies to erect poles under the new rules and regulations. In fact, there are a dozen. I offer the following resolution:

Resolved, That the applications from companies now before the Board to erect poles under the new rules and regulations for overhead conductors for electric light and power be all referred to the Expert, and he be requested to report at the next meeting on what streets poles can be erected under these rules and regulations.

Unanimously adopted.

The following communication from List & Lemon, masons and builders, 537 West 14th street, was read:

NEW YORK, Nov. 20th, 1888.

The Board of Electrical Control, 30th Street and Broadway:

GENTLEMEN:—There is a dead pole at 241 Centre street that is in the site of a 12-inch wall that we have to build. Please have it removed without delay, and oblige.

Yours respectfully,

LIST & LEMON.

The following report of Inspector Keyes on the communication of List & Lemon was read:

The Bureau of Incumbrances was notified to remove this pole on November 7th.

M. S. KEYES.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to write a letter to the Commissioner of Public Works in regard to the pole complained of by List & Lemon, and enclose their letter, together with the report of the Inspector thereon.

Unanimously adopted.

The following communication and reports of Inspectors thereon were read:

NEW YORK, November 21st, 1888.

In front of my premises, 1671 & 1673 Second avenue, bet. 86th and 87th streets, is a telegraph pole belonging to the Harlem Lighting Co., and not in use. Will you please have same removed, and oblige.

Very truly yours,

G. B. DISBROW, AGENT,

255 East 86th Street.

Nov. 22d. This pole is dead, and has no reason to be there.

FITZPATRICK.

Notified H. L. Co. Nov. 23d to remove pole.

M. S. KEYES.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to write a letter to the Commissioner of Public Works in regard to the pole complained of by Mr. G. B. Disbrow, and enclose Mr. Disbrow's letter, together with the reports of the Inspectors thereon.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the applications of the United States Illuminating Company, dated respectively November 15, 1888, November 15, 1888, November 15, 1888, November 19, 1888, November 21, 1888, November 23, 1888, to connect arc lamps with circuits at places therein designated, be granted.

Unanimously adopted.

Resolved, That the application of the Brush Electric Illuminating Company, dated November 23, 1888, to connect electric lamps at places therein designated, be granted.

Unanimously adopted.

Resolved, That the application of Messrs. Levy Brothers, dated November 23, 1888, to run a burglar alarm wire as therein specified, be granted.

Unanimously adopted.

Mr. D. Morgan Hildreth, on behalf of the Johnstone Underground Electric Light and Power Company, presented to the Board the following petition:

To the Honorable Board of Electrical Control in and for the City of New York:

GENTLEMEN :—The Johnstone Underground Electric Light and Power Company, a corporation duly organized November 20th, 1888, under and pursuant to the Manufacturing Corporation Act, Chapter 40, of the Laws of 1848, and the amendments thereto, with lawful right to manufacture, transmit and use electricity for producing light, heat and power as contemplated by the Act, Chapter 73, of the Laws of 1882, passed April 17th, 1882, entitled "An Act to amend Chapter 512 of the Laws of 1879, entitled An Act to authorize Gas Light Companies to use electricity instead of gas for lighting streets, public places and public and private buildings in cities, villages and towns, within this State," respectfully request your Honorable Board under and pursuant to the provisions of Section 1 of the Act, Chapter 716, of the Laws of 1887, entitled, "An Act in relation to Electrical Conductors in the City of New York," to consent that your petitioners may have power to lay and construct suitable wires and other conductors with the necessary pipes or other fixtures in and under the streets, avenues and public parks and places of the City of New York for transmitting and distributing electricity within the said city under such reasonable regulations as your Honorable Board may provide.

And the said Johnstone Underground Electric Light and Power Company further respectfully requests your Honorable Board to exercise all powers conferred upon it by the said Act, Chapter 716, of the Laws of 1887, and by any prior or other law of this State to enable your Petitioners to begin and prosecute the transaction of the business for which it was organized, and to erect, locate and construct electrical conductors in the City of New York and through the said streets, avenues, public parks and places thereof upon such terms and conditions as the public convenience and welfare may require and as your Honorable Board shall deem to be proper.

In witness whereof, the said Johnstone Underground Electric Light and Power Company has caused this application to be signed by its President and attested by its Secretary this twenty-third day of November, 1888.

W. H. JOHNSTONE, Prest.

Attest,

(Seal) GEO. R. THOMPSON, Secretary.

Commissioner Gibbens offered the following resolution:

Resolved, That the Petition of the Johnstone Underground Electric Light and Power Company for a franchise be referred to a committee to be appointed by the Chair to investigate the character of this Company and report thereon.

Unanimously adopted.

President Hess appointed Commissioner Gibbens the committee under the resolution referring the Petition of the Johnstone Underground Electric Light and Power Company.

[NOVEMBER 23, 1888.]

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Commercial Telegraph Company, dated November 23, 1888, to string wires as therein indicated, be granted.

Unanimously adopted.

The following communication was read:

444 W. 34TH STREET,

November 12th, 1888.

To the Board of Electrical Control:

GENTLEMEN:—I wish to have removed a telegraph pole that is on the sidewalk opposite one of my buildings that I am erecting on Manhattan avenue bet. 112th and 113th streets; the pole is 60 feet north of the northeast corner of 112th street on Manhattan avenue.

Yours respectfully,

W. B. PETTIT.

Commissioner Gibbens offered the following resolution:

Resolved, That the communication of Mr. W. B. Pettit be answered by the Secretary of the Board, and that he be notified that the pole belongs to the Fire Department, over whose poles this Board has no control, and that it be suggested to him to request the Fire Department to assist him.

Unanimously adopted.

The following communication was read:

CITY OF BOSTON,

DEPARTMENT FOR THE INSPECTION OF BUILDINGS,

OLD STATE HOUSE, Nov. 16th, 1888.

To the City Clerk of the City of New York:

DEAR SIR:—Will you please inform this Department by return mail what statutes or ordinances now exist, or are proposed, relating to overhead wires being maintained, or said wires being placed underground. The matter of placing all overhead wires underground is under consideration in this city, and any information relating to the disposition of said wires will be appreciated.

Respectfully yours,

CHARLES S. DAMRELL, Clerk of Dept.

W.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Secretary be directed to answer the communication of the Clerk of the Department for the Inspection of Buildings of the City of Boston, and

to enclose a copy of our reports and also the rules and regulations relating to overhead conductors.

Unanimously adopted.

Resolved, That the application of the Metropolitan Telephone and Telegraph Company to set a new pole at 37 Bayard street to take the place of an old one, which is in a dangerous condition, be granted.

Unanimously adopted.

The following application of the United States Illuminating Company and report of Inspectors thereon was read:

NEW YORK, Nov. 9th, 1888.

THEODORE MOSS, Esq., Secretary Board of Electrical Control:

SIR:—Permission is requested by the United States Illuminating Company to place No. 4 wires, Holmes, Booth & Hayden K. K. insulation on their poles in Broome St., from Bowery to Chrystie St., to replace wire stolen.

Respectfully yours,

A. E. SCOULLAD, Supt.

Nov. 14.—There are no electric poles in Broome street between the Bowery and Chrystie street. I have reported on August 16 these wires that run from Chrystie street and in Broome to Orchard to Grand as dead and useless loops, and they have been removed.

M. S. KEYES,

F. J. FITZPATRICK.

Commissioner Gibbens: It is not necessary to do anything about this communication of the United States Illuminating Company. The wire certainly has not been stolen. It has been taken into custody by the Department of Public Works.

Hon. Nicholas R. O'Connor, on behalf of the Electric Power Company, asked leave to withdraw the application of that Company made prior to the adoption of the new rules and regulations.

President Hess: Consider it withdrawn.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Tuesday, December 4th, 1888, at 12 o'clock M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read and approved.

Commissioner Gibbens stated to the Board that for lack of time he had been unable to examine the application and papers of the Johnstone Electric Light and Power Company, and, therefore, was not yet ready to make his report, and asked for further time, which the Board granted.

Commissioner Hess moved the following resolution:

Resolved, That the application of the Manhattan Electric Light Company, Limited, dated November 23, 1888, to erect four poles on 18th street from Broadway to Fifth avenue, be laid on the table.

Unanimously adopted.

Expert Wheeler made the following report to the Board:

NEW YORK, December 4, 1888.

To the Honorable, the Commissioners of the Board of Electrical Control:

GENTLEMEN:—I have to report that I have examined the territory covered by various applications for permission to erect pole lines referred to in your resolution of November 23d, as follows:

Resolved, That the applications from companies now before the Board to erect poles under the new rules and regulations for overhead conductors for electric light and power be all referred to the Expert, and he be requested to report at the next meeting on what streets poles can be erected under these rules and regulations.

I find that both sides of First avenue, from Houston street to the Harlem River, are occupied by numerous lines, some of them on opposite sides of the street, but belonging to a single owner, and others dead or unnecessary.

The east side of First avenue appears the least difficult to clear for the purpose of providing a route for a first-class consolidation electric light line under the new rules.

To clear this side of the avenue it will be necessary to have the following short portions of lines removed from the east to the west side of the avenue or consolidated with duplicate lines already existing on the west side of the avenue, by their respective owners.

Met. Tel. & Tel. Co., Houston to 5th streets; Western Un. Tel. Co., 2d to 21st streets; Western Un. Tel. Co., 20th to 33d streets; Met. Tel. & Tel. Co., 38th to 115th streets, to be consolidated with duplicate line now on the east side to 106th street and extended from 106th to 115th streets.

Brush Co., to be rebuilt consolidation style from 14th to 59th Sts.

The only other poles on this side of the street are Fire Department lines in scattered places. These will probably all be removed by the Fire Department in consideration of getting away from the electric light lines.

Very respectfully,

S. S. WHEELER, Elec. Expert to the Board.

Commissioner Hess—Have you any recommendation to make?

Expert Wheeler—I would recommend that the companies mentioned in the list, whose lines are on the east side of First avenue, be requested formally by the Board to comply with the described changes, and that permission be granted to the various electric light companies to erect a fine heavy consolidation line on the east side of First avenue—if these changes can be secured—and that the route be divided up equally among the different companies, so that each company can erect and own a part of the poles covering their proportionate part of the route, and which will be more or less security to them that they will be well treated on the other poles in the through line that they will have to go over that are of other ownership.

Commissioner Gibbens offered the following resolution:

Resolved, That the recommendations of the Expert be adopted by the Board, and that the Manhattan Electric Light Company be authorized to build on the east side of First avenue from the Harlem River to 59th street, the Brush Illuminating Company from 59th to 14th streets, and the East River Electric Light Company from 14th to Houston streets; and that the Secretary of the Board be directed to notify the companies having lines of wire on the east side of that avenue to remove the same or transfer them to the other side of the street, in accordance with the recommendation of the Expert; and that these permits be granted to these electric light companies on the condition that the lines be completed under the direction of the Expert and the Engineer of the Board within thirty-five days, and the lines of poles so constructed shall be for the use of all companies operating electrical conductors which desire to make use of the same; and nothing herein contained to be deemed to grant greater privileges or franchises to the companies named than to other electric lighting companies.

Unanimously adopted.

Commissioner Gibbens offered the following resolutions:

Resolved, That part of the application of the East River Electric Light Company, dated November 17, 1888, asking permission to erect a pole line on 22d street from Third avenue to the North River, and a like application of the New York Safety Electric Light and Power Company, be denied; there being a subway in 23d street.

Unanimously adopted.

Resolved, That permission be granted to the Manhattan Electric Light Company to erect a line of poles in 80th street, from Avenue B to Third avenue, in accordance with the rules and regulations of the Board—the poles to be used by any company desiring to use the same.

Unanimously adopted.

Resolved, That the Secretary be directed to advise and direct the Harlem Lighting Company to replace all of its lamp-posts which are not in accordance with the plan adopted by the Board with lamp-posts which are in accordance with that plan immediately.

Unanimously adopted.

Resolved, That the Secretary be directed to request the Western Union Telegraph Company to make use of the permit granted by the Board to place its wires on Second avenue on the elevated railroad structure there and remove the poles and wires belonging to that Company from that street.

Unanimously adopted.

Resolved, That the Secretary be directed again to call the attention of the Western Union Telegraph Company to the fact that its poles are triplicate in 46th street throughout the entire street, and to request it to remove two lines of the three; also to remove any other duplicate poles which it has on other streets of the city; also to remove its poles from Third, Sixth and Ninth avenues, where permission had been granted to that Company to string wires on the elevated railroad structures in those avenues; also to remove the old cable which is hanging in a very dangerous and unsightly condition at the 18th street elevated railroad station in Sixth avenue.

Unanimously adopted.

The following communication was read:

NEW YORK, December 3d, 1888.

To the Honorable Board of Electrical Control:

GENTLEMEN:—The Citizens' Electric Light Company of the City of New York hereby respectfully applies for a franchise, or permit, to furnish electric light, heat and power throughout the City of New York, of the same tenor as those heretofore granted by your Board to the Safety Light and Power Company, Manhattan Electric Company and the Electric Power Company, and in addition to, or instead of, the intangible compensation exacted from said companies for their franchises (such compensation being the creation of a Board of Aldermen) the Citizens' Electric Light Company hereby offers to pay to the Comptroller of the City of New York five per centum of its gross receipts, or said Company will compete, at a public bidding before your Board, to fix a lump sum for said franchise to be paid to the Comptroller of the City of New York.

And said Company will give a bond in \$50,000 that it will in good faith carry on the business of electric lighting in this city, and will not sell out to, or seek to be merged into existing companies.

Very respectfully,

CHARLES B. PAGE, of Counsel.

President Hess offered the following resolution:

Resolved, That the Secretary be directed to notify the Citizens' Electric Light Company to make out an application in the customary form.

Unanimously adopted.

Commissioner Gibbens: We have a communication before the Board from the United States Illuminating Company to the effect that for the accommodation of the general public who desire to look at the magnificent thermometer erected by the New York Sun on the other side of Broadway just above here, it would like to remove its pole from that side of the street to this side, and so enable the public to look at that "Sun" thermometer without interference. It is not easy for this Board to grant permits to the United States Illuminating Company in this district, but inasmuch as this is for the interest of the general public a good deal more than for the United States Illuminating Company, and cannot anyway effect the status of that Company, I offer the following resolution:

Resolved, That the application of the United States Illuminating Company, dated December 1, 1888, to replace the pole in front of the "Sun" building on Broadway above 31st street by another pole on the opposite side of the street on the line between 1248 and 1250 Broadway.

Unanimously adopted.

Commissioner Gibbens offered the following resolutions:

Resolved, That the application of the United States Illuminating Company, dated respectively November 27, December 1, December 3, December 3, 1888, to connect arc lamps with circuits at places therein respectively designated, be granted.

Unanimously adopted.

Resolved, That the Secretary of the Board be directed to send to the United States Illuminating Company some of the blanks which are authorized by this Board, so that that Company can make its applications in the same form as other companies.

Unanimously adopted.

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated November 23, 1888, to rebuild the line on the Boston Road from 169th street to the Bronx River, be granted.

Unanimously adopted.

Resolved, That the application of the Ball Electrical Illuminating Company, dated October 4th, 1888, to run two wires on Ninth avenue from 34th to 42d streets, on poles of the Mount Morris Electric Light Company, be referred to the Expert to report on the condition of its circuit at this point.

Unanimously adopted.

Resolved, That the application of the Mount Morris Electric Light Company, dated October 25th, 1888, to erect poles and string wires in localities therein designated, be referred to the Expert to report thereon.

Unanimously adopted.

Resolved, That the Secretary be directed to issue permits to the Brush Electric Illuminating Company to connect electric lamps at all places designated in its two applications, dated respectively November 27th and 28th, 1888, which are not on the line of subways, and that, in regard to the setting of the pole in 36th street applied for in the application, dated November 27th, the Expert report at the next meeting.

Unanimously adopted.

Resolved, That the applications of the East River Electric Light Company, dated respectively November 27th, November 30th, November 30th and December 1st, 1888, to string wires and erect lamps as therein respectively specified, be granted.

Unanimously adopted.

Resolved, That the application of the North New York Lighting Company, dated November 30th, 1888, to replace one pole on corner of Third avenue and 140th street, also to erect four poles on 140th street, from Third avenue to Morris avenue, and to string wires on same, be referred to the Expert to report on at the next meeting.

Unanimously adopted.

The following application of the Empire & Bay States Telegraph Company was read:

Application of the Empire & Bay States Telegraph Company for permit to place Electrical Conductors overhead.

NEW YORK, October 23d, 1888.

To the Board of Electrical Control:

Permission is hereby requested by the Empire & Bay States Telegraph Company to erect a line of telegraph poles and to place telegraph wires thereon over and along the route and streets hereafter named, to wit:

From Harlem River along Ryder avenue to 141st street, east side, 30 poles; thence along 141st street to Morris avenue, 3 poles; thence along Morris avenue from 141st street to 161st street, west side, 31 poles; thence along 161st street to 162d street, 5

poles; thence along 162d street to Walton avenue, 8 poles; thence along Walton avenue to Girard avenue, 6 poles; thence along Girard avenue to central avenue, 35 poles; thence along Central avenue to the city line, 178 poles.

The Company whose application is hereby presented is organized under the general telegraph act of this State, and has actually constructed, and there is now built and ready for use, a complete line from the city line of New York City, near Woodlawn Cemetery, to the offices of said Company in the city of Boston. The work and material employed in constructing this line has been paid for in full and there has now been expended in its construction over one hundred and eighty thousand dollars in cash.

The total liabilities of the Company at the present time do not exceed ten thousand dollars, and there is at the command of the company sufficient capital to discharge all its liabilities.

Inasmuch as no subway is constructed through the annexed district, and inasmuch as the Company have in good faith constructed its whole line to the City limits of New York State, and is anxious and desirous of at once completing telegraph connections between New York and Boston, your honorable Board is respectfully requested that a permit may be granted at the earliest possible date for the construction of the line above indicated, from Woodlawn to the Harlem River.

The Company submits itself to the rules and regulations of the Board and is entirely willing to follow any feasible directions of the Board.

Every effort to obtain connection between the city line and Manhattan Island has been exhausted, and the only way left in which said company can complete its line to New York City is by erecting its own poles and wires.

The system to be used by this Company is that known as the "Multiplex" system of telegraphy. Respectfully submitted,

THE EMPIRE & BAY STATES TELEGRAPH CO.,

By DOHERTY, DURNIN & HENDRICK.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Secretary be authorized and directed to issue a permit to the Empire & Bay States Telegraph Company to erect such poles as may be necessary for the carrying of its wires from the city line along a route to be designated by the Engineer to a point where it can best meet the poles of the North New York Lighting Company, and thence to run its wires on those poles of the New York Lighting Company to the Harlem River.

Unanimously adopted.

Resolved, That the application of the Manhattan Electric Light Company, dated December 4, 1888, to erect a line of poles on Third avenue, from 86th to 42d streets, be referred to the Expert to report upon.

Unanimously adopted.

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated November 30, 1888, to erect a pole on the line between 149 and 151 Crosby street, in place of the one now standing a few feet south of that point, at the request of the owner of the property, be granted.

Unanimously adopted.

Resolved, That the Harlem Lighting Company be authorized to replace its iron poles with wooden ones on Third avenue, from 86th street to the Harlem River, subject to the rules and regulations of the Board—construction to be approved by the Expert.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York, on Friday, December 7th, 1888, at 12 o'clock M.

On motion of President Hess, the reading of the minutes of the last meeting was dispensed with.

Commissioner Gibbens offered the following resolutions:

Resolved, That the application of the Harlem Lighting Company, dated December 5, 1888, to connect arc lights at 1914 Third avenue and 1624 Third avenue, be granted.

Unanimously adopted.

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated December 6th, 1888, to erect a new pole at 31 Oak street in place of the one now there, which is in a dangerous condition, is granted.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated December 7, 1888, to connect lamp with circuit at 946 Third avenue, be granted.

Unanimously adopted.

Commissioner Moss moved the following resolution:

Resolved, That the application of the Mount Morris Electric Light Company, dated November 27, 1888, to erect poles on 53d street, from Ninth to Tenth avenue, be granted.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Brush Electric Illuminating Company, dated December 5th, 1888, to connect electric lamps with its circuits at places therein designated, be laid on the table until the disposition of the injunction in the suit of the United States Illuminating Company against the Board.

Unanimously adopted.

The following communication and application from the Edison Electric Illuminating Company were read:

NEW YORK, December 6th, 1888.

JACOB HESS, ESQ., President Board of Electrical Control, 1218 Broadway, New York City:

DEAR SIR:—Herewith enclosed please find application for permission to erect a pole on the corner of Fifth avenue and 50th street, for the reasons stated in the request, and by the granting of which you will greatly oblige this Company, as the scaffolding is very rapidly being removed, and we will soon be required to provide other support for the cable, which is used to connect the residences of D. O. Mills and Whitelaw Reid, in the interval of our getting our underground system down in this part of the city.

Requesting for this the favorable action of your Board, I am,

Yours very truly,

THE EDISON ELECTRIC ILLUMINATING CO. OF N. Y.

NEW YORK, December 6th, 1888.

Permission is hereby requested by the Edison Illuminating Company of New York to erect a pole on the southeast corner of Fifth avenue and 50th street for the purpose of carrying temporarily a cable now supported on the scaffolding of the Cathedral, and which is being removed, thus necessitating other support until we are granted permission to make an underground crossing at this point, and for which we have had an application in for two months, but which has not yet been granted, neither is it likely to be this year.

Subject to the Rules and Regulations of the Board of Electrical Control, which are hereby agreed to by

THE EDISON ILLUMINATING CO. OF NEW YORK,

By JOHN J. BEGGS, Vice-Pres. & Gen'l M'gr.

To the Board of Electrical Control.

Commissioner Gibbens offered the following resolutions:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized and directed to make the connection suggested by the application of the Edison Illuminating Company of New York to this Board, dated December 6th, 1888,

immediately; and that the Secretary notify the Edison Illuminating Company of New York of such authorization and direction.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated December 6, 1888, to erect new support poles in place of old ones, which have become decayed and cut away by trucks in the localities therein mentioned, be granted.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated December 6th, 1888, to make connections with its circuits for lamps, at the places therein designated, be granted.

Unanimously adopted.

Resolved, That the application of the East River Electric Light Company, dated December 5, 1888, to hang lamps and connect same with its circuits at 123 Third avenue and 82 First avenue, be granted.

Unanimously adopted.

President Hess offered the following resolution:

Resolved, That the Secretary be directed to write a letter to Mr. Edward H. Goff, representing the Democratic State Committee, requesting him to inform the Board as to the ownership of the wires put up for campaign purposes extending from the Bijou Opera House to No. 29 West 29th street.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Manhattan Electric Light Company, Limited, dated December 4, 1888, to erect a line of poles on Third avenue, from 86th street to 42d street, be denied.

Unanimously adopted.

Resolved, That a committee be appointed by the Chair to draw up the annual report of the Board to the Governor and Legislature, and to submit it to the Board at a meeting to be held prior to December 25th.

Unanimously adopted.

Commissioner Moss offered the following resolution:

Resolved, That the application of the North New York Lighting Company, dated November 30, 1888, to replace one pole on corner of Third avenue and 140th street, also to erect four poles on 140th street, from Third avenue to Morris avenue, and to string wires on same, be laid over.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the communication from Sub-Treasurer McCue, complaining of a pole overhanging the Sub-Treasury building, be referred to the Secretary to report upon at the next meeting.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board in the City of New York, on Tuesday, December 11th, 1888, at 12 o'clock, M.

On motion of Commissioner Moss, the reading of the minutes of the previous meeting was dispensed with.

The following application of the Consolidated Telegraph and Electrical Subway Company was read:

NEW YORK, N. Y., December 10th, 1888.

To the Honorable The Commissioners of the Board of Electrical Control, HON. JACOB HESS, President, 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith beg to submit for your authorization and approval the following line of electrical subways for construction during the present season, and for which we ask your favorable consideration.

From the manhole on the southwest corner of Madison Square, directly west across Broadway and 5th avenue intersection to the northwest corner of 23d street and 5th avenue. The construction to consist of wrought iron pipe laid in hydraulic cement concrete, which is the same construction with which this crossing connects.

The building of this crossing is required at the present time for the special accommodation of the Western Union Telegraph Company, which has applied for connections with the subway in this immediate vicinity.

The map showing the location of the above line is submitted herewith.

Very respectfully,

EDWARD LAUTERBACH, President.

Commissioner Moss offered the following resolution:

Resolved, That the application of the Consolidated Telegraph and Electrical Subway Company, dated December 10th, 1888, for authorization and approval of a line of electrical subways for construction, "from the manhole on the southwest corner of Madison Square, directly west across Broadway and 5th avenue intersection to the northwest corner of 23d street and 5th avenue, the construction to consist of wrought iron pipe laid in hydraulic cement concrete," be granted.

Unanimously adopted.

The following communication was received from the United States Illuminating Company:

NEW YORK, Dec. 10th, 1888.

HENRY S. KEARNY, ESQ., Engineer Board of Electrical Control:

SIR:—With regard to changing pole on Broadway to accommodate "The Sun" office, the permit sent us by the Board of Electrical Control does not cover the ground as I wrote you.

What this company wants is a permit to erect a new pole on the east side of Broadway, between No. 1248 and No. 1250, and connect our circuits thereto before removing our wire and taking down the old pole.

We also request that the permit be issued to us for this work without the Rules and Regulations of the Board printed thereon, as they now are, as we do not want any further complication, particularly as this change is for other's accommodation and not ourselves.

Yours respectfully,

A. E. SCOULLAD, Supt.

Commissioner Gibbens offered the following resolutions:

Resolved, That in the matter of the communication of the United States Illuminating Company, dated December 10th, 1888, the Secretary be directed to arrange the matter in such a way that the Company will do the work referred to in the communication for the benefit of the "Sun."

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated December 10th, 1888, to connect their lamps with their circuits at the points therein designated, according to the rules and regulations of the Board, be granted.

Unanimously adopted.

Resolved, That the application of the Brush Electric Illuminating Company, dated December 8th, 1888, to place cut-out box on pole in front of 893 Broadway, and to connect electric lamps with their circuits at points therein specified, be granted.

Unanimously adopted.

Commissioner Gibbens: There are some applications here to erect poles. Now, inasmuch as the question of carrying out the rules and regulations of the Board where these electric light poles are asked is still in abeyance, I move that these go over.

President Hess, in regard to these applications, that of the Mount Morris Electric Light Company offered the following resolution:

Resolved, That the application of the Mount Morris Electric Light Company, dated December 11th, 1888, to erect poles on streets therein named, be granted.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Mount Morris Electric Light Company, dated December 11th, 1888, to erect poles on streets therein named, lie on the table until the Board can know more about it.

Lost. Vote: Commissioner Gibbens, "aye"; Commissioners Hess and Moss, "no."

Commissioner Gibbens offered as an amendment to the resolution of President Hess the following resolution:

Resolved, That the application of the Mount Morris Electric Light Company, dated December 11th, 1888, and all other applications before the Board to erect poles, be referred to the Expert, to ascertain whether these poles can be constructed in accordance with the rules and regulations, and he be requested to report as soon as possible.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to issue a permit to the Empire and Bay States Telegraph Company to erect a line of poles, beginning at the city line and Railroad avenue and down that avenue to the Harlem River—the poles to be approved by the Engineer of the Board—and to string two wires on the same.

Adopted. Vote: Commissioners Gibbens and Moss "aye"; Commissioner Hess "no."

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Board, in the City of New York on Friday, December 21st, 1888, at 12 o'clock M.

Present: Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

On motion of Commissioner Gibbens, the reading of the minutes of the last meeting was dispensed with.

Commissioner Gibbens—The committee on the draft of the Annual Report to the Governor and Legislature is ready to report. I move the following resolution:

Resolved, That the Board go in executive session to listen to the reading of the Annual Report to the Governor and Legislature.

Unanimously adopted.

The Board thereupon went into executive session.

Executive Session.

Commissioner Gibbens, as the committee appointed for that purpose, presented to the Board a draft Report to the Governor and Legislature, and the same was read.

Commissioner Moss offered the following resolution:

Resolved, That the Report of the Board to the Governor and Legislature, presented by Commissioner Gibbens, be accepted and approved, and that the same be printed.

Unanimously adopted.

The Board thereupon proceeded with the regular business.

Expert Wheeler reported unfavorably on the application of the Ball Electrical Illuminating Company, dated November 3, 1888, and stated that its wires stretched over house-tops were in a very dangerous condition, being able to be touched by children.

Commissioner Gibbens offered the following resolutions:

Resolved, That the application of the Ball Electrical Illuminating Company, dated December 3, 1888, to attach lamps on its circuits at 466 and 497 Seventh avenue, be denied.

Unanimously adopted.

Resolved, That the Secretary be directed to notify the Ball Electrical Illuminating Company to remove its housetop wires, which are too near the roofs of houses over which they are strung.

Unanimously adopted.

Resolved, That the application of the North New York Lighting Company, dated November 15, 1888, to erect poles and string wires on the streets therein named, be granted; and these poles be such as are allowed by the rules and regulations of the Board, maintaining, as far as possible, a straight course along one side of the street, and that it be directed to replace its iron poles with wooden ones of the same character; subject to the approval of the Expert as to the character of material used and the route to be adopted.

Unanimously adopted.

Commissioner Moss offered the following resolution:

Resolved, That the application of the Mount Morris Electric Light Company, dated December , 1888, to erect poles and string wires in the localities therein named,

be granted, the route and character of the construction to be subject to the approval of the Expert of the Board.

Unanimously adopted.

Applications of the Ball Electrical Illuminating Company, dated respectively December 3, 4 and 7, unfavorably reported upon by the Expert, were laid on the table.

The following communication was read:

NEW YORK, December 12, 1888.

THEODORE MOSS, ESQ., Secretary, Board of Electrical Control, 1218 Broadway, City:

SIR:—I am instructed by the Mayor to transmit herewith for the information of your Board the enclosed copies of plans, etc., relating to a system of subways for electric light wires, accompanying a letter from Andrew Derrom, architect and engineer, Paterson, N. J.

Yours respectfully,

HENRY H. SHERMAN, Private Secretary.

Commissioner Gibbens offered the following resolutions:

Resolved, That the plan of subways of Andrew Derrom, of Paterson, New Jersey, be referred to the Engineer to examine and report.

Unanimously adopted.

Resolved, That a copy of the communication of Messrs. Griffith & Co., relating to a pole of the Harlem Lighting Company in front of their show window at 2241 Third avenue, be sent to that Company.

Unanimously adopted.

The following communication was read:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,

No. 18 CORTLANDT STREET,

NEW YORK, N. Y., December 17th, 1888.

To the Honorable, the Commissioners of the Board of Electrical Control, Hon. JACOB HESS, President, 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith beg leave to submit for your authorization and approval the following lines of electrical subways for construction during the present season, and for which we ask your favorable consideration.

From the manhole on the east side of Broadway at the intersection of 21st street, directly across to the west side of Broadway, terminating in a flush box. The construction to consist of wrought iron pipe laid in hydraulic cement concrete, which is the same construction adopted for the lines with which this crossing connects.

The building of this crossing is required at the present time for the special accommodation of the Metropolitan Telephone and Telegraph Company, which has applied for a connection with the subway in this immediate vicinity.

The map showing the location of the above line is submitted herewith.

Very respectfully,

EDWARD LAUTERBACH, President.

Commissioner Moss offered the following resolution:

Resolved, That the application of the Consolidated Telegraph and Electrical Subway Company, dated December 17, 1888, for authorization and approval of a line of electrical subways, "from the manhole on the east side of Broadway at the intersection of 21st street, directly across to the west side of Broadway, terminating in a flush box," construction to consist as therein specified, be granted.

Unanimously adopted.

The following communications were read:

NEW YORK, December 19, 1888.

THEODORE MOSS, Sec'y, Board of Electrical Control, 1218 Broadway, N. Y.:

DEAR SIR:—ANSWERING your favor of the 7th inst., in re the removal of this Company's poles and wires now on the east side of First avenue, I beg to say that this Company has a line of poles on the east side of the street named, from Second street to 21st street; and from 23d street to 39th street, which I will arrange to have removed with as little delay as possible. This Company also has wires known as Mutual Union wires on the east side of the avenue, from Houston street to Fifth street; and others known as the American Rapid, on the east side of the avenue, from 20th to 33d street, both on poles belonging to the Fire Department of the City of New York.

Very respectfully,

W. C. HUMSTONE, Superintendent Wes. Un. Tel. Co.

NEW YORK, December 20, 1888.

THEODORE MOSS, ESQ., Secretary the Board of Electrical Control, 1218 Broadway, New York City:

DEAR SIR:—YOUR favor of 8th inst., communicating to us the Resolution of your Board with relation to our application for permission to erect a pole at the corner of 50th street and Fifth avenue was duly received; and application made through the Consolidated Telegraph and Electrical Subway Co. to the Department of Public Works for permission to open the street; but which they positively refuse to grant, and we are, therefore, compelled to renew our application for permission to temporarily erect the pole as previously specified. But I am of the opinion that we can substitute a larger pole for the one now in use, which will answer all purposes, and thus obviate the necessity of erecting an additional pole. If you will therefore grant such authority as may be needed, you will greatly oblige.

Yours very truly,

THE EDISON ILLUMINATING CO. OF NEW YORK,

By JOHN J. BEGGS, Vice-Pres. & Gen. Manager.

Commissioner Gibbens offered the following resolutions:

Resolved, That the application of the Edison Illuminating Company of New York, dated December 20, 1888, to erect a pole at the corner of 50th street and Fifth avenue, be denied.

Unanimously adopted.

Resolved, That the application of the Mount Morris Electric Light Company, dated December 21, 1888, to erect a line of carrying poles on Tenth avenue, between 14th and 65th streets, be referred to the Expert.

Unanimously adopted.

President Hess offered the following resolutions:

Resolved, That the application of the Brush Electric Illuminating Company, dated December 13, 1888, to put a cut-out box on pole at 750 Broadway, be granted.

Unanimously adopted.

Resolved, That the application of the East River Electric Light Company, dated December 11th, 1888, to hang lamps and connect same with its circuits at places therein designated, be granted.

Unanimously adopted.

Commissioner Gibbens offered the following resolutions:

Resolved, That the application of the East River Electric Light Company, dated December 18, 1888, to reset one pole, etc., be referred to the Expert to report upon at the next meeting.

Unanimously adopted.

Resolved, That the application of the East River Electric Light Company, dated November 14, 1888, to set a line of poles on 49th street, from Third avenue to a point 350 feet west of Fourth avenue, be granted—the position of the poles, the route to be taken and the character of the construction to be subject to the approval of the Expert of the Board.

Unanimously adopted.

President Hess offered the following resolution:

Resolved, That the application of the North New York Lighting Company, dated November 30, 1888, to replace one pole on the corner of Third avenue and 140th street, and to erect four poles on 140th street, from Third avenue to Morris avenue, and to string wires on same, be granted.

Unanimously adopted.

Commissioner Gibbens offered the following resolutions:

Resolved, That permission be granted to the United States Illuminating Company to connect a lamp with its circuit at the junction of Broadway, Fifth avenue and 23d street, without prejudice to other matters in dispute between this Board and the said Company, at any time that the Company see fit to apply for the same by any of its authorized agents.

Adopted. Vote: Commissioners Gibbens and Moss "aye"; President Hess "no."

Resolved, That in the permits to be issued by the Secretary to the three companies to erect poles on First avenue, under a resolution of the Board heretofore granted, there be added the reservation that the route shall be left to the discretion of the Expert.

Unanimously adopted.

President Hess offered the following resolutions:

Resolved, That the applications of the United States Illuminating Company, dated respectively December 12th, 13th, 14th, 18th, 19th and 20th, 1888, to connect lamps with its circuits at the respective places therein designated, be granted.

Unanimously adopted.

Resolved, That the applications of the United States Illuminating Company, dated respectively December 13th, 18th and 18th, 1888, to do the respective acts therein specified, be referred to the Expert.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That when the Board adjourns it adjourn to meet in the office of the Mayor on such day after the first of January as may be convenient to him; and that the Secretary be directed to ascertain with reference to this and notify the members of the Board.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday, January 18th, 1889, at 12 o'clock, noon.

Present: Mayor Hugh J. Grant, Commissioners Jacob Hess, President; Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read and approved.

President Hess called Commissioner Gibbens to the Chair.

President Hess offered his resignation as President of the Board in the following communication to it:

NEW YORK, Jan. 18th, 1889.

To the Board of Electrical Control:

GENTLEMEN:—I herewith resign as President of your Board.

JACOB HESS.

Commissioner Moss offered the following resolution:

Resolved, That the resignation of Commissioner Jacob Hess, as President of the Board, be accepted, and that he receive the thanks of the Board for his services as its President.

Unanimously adopted.

Commissioner Hess offered the following resolution:

Resolved, That his Honor, the Mayor, be elected President of this Board.

Adopted; all voting "aye," except the Mayor, who did not vote.

Mayor Grant: I thank you for your kindness in electing me to the Presidency of this Board. I shall endeavor to do my duty while a member of it, and I hope I shall succeed in fulfilling that mission for which the Commission was created. I do not think there is any necessity for making any further remarks. What is the pleasure of the Board?

The following communication of the Metropolitan Telephone and Telegraph Company was read and, on motion of Commissioner Gibbens, ordered to be spread on the minutes:

NEW YORK, January 10th, 1889.

S. S. WHEELER, ESQ., Electrical Expert, Electrical Board of Control, 1218 Broadway:

DEAR SIR:—Referring to the line of poles on First avenue, between 56th and 106th streets, I beg to say that this Company will proceed to take the line down, commencing early next week.

Yours truly,

W. H. ECKERT, Gen'l Mgr.

Commissioner Gibbens offered the following resolution:

Resolved, That the request contained in the communication of Hon. A. McCue, Assistant Treasurer, dated January 16, 1889, that a pole of the Metropolitan Telephone and Telegraph Company, which endangers the safety of the Sub-Treasury Building, shall be removed from proximity to the roof of that building, be referred to the President of said Company, with a request that the pole be removed.

Unanimously adopted.

The following communication and petition was read, and (with the exception of names appended to the petition) ordered to be spread on the minutes:

NEW YORK, 14th January, 1889.

DEAR SIR:—Huge telegraph poles are being put up in 80th street, reaching already the s. w. corner of Third avenue, and I understand that it is being done without permission.

A petition signed by the residents of said street will be presented to the Hon. Subway Commission against the defacing of the street by unsightly poles, which I trust will receive due consideration.

Anticipating my thanks, I have the honor to remain,

Yours respectfully,

LOUIS CONTENCIN,

161 E. 80th Street.

To the Hon. Commissioner, Theodore Moss, City.

NEW YORK, January , 1889.

To the Board of Electrical Control, HON. JACOB HESS, President:

We, the undersigned, owners of property on 80th street, west of Third avenue, respectfully but earnestly pray you to use your power and not to give your permission to any company to set up poles, to string wires thereon, to the disfigurement of a nice, clean street at present, and to the great detriment of our property.

Hoping and relying on your firm resistance to this threatening nuisance, we ask for us again your protection.

(Here appended are 33 names with addresses).

Commissioner Gibbens offered the following resolution:

Resolved, That the communication of Chevalier Louis Contencin, with accompanying petition (except names) be spread on the minutes, and that the Chevalier be notified that no permit for a pole on that street west of Third avenue has been granted by the Board.

Unanimously adopted.

The following opinion of Judge Lawrence, in the case of the United States Illuminating Company against Jacob Hess, Theodore Moss, Daniel L. Gibbens and Abram S. Hewitt and others, was, on motion of Commissioner Gibbens, ordered to be spread on the minutes:

SUPREME COURT, CHAMBERS.

THE UNITED STATES ILLUMINATING COMPANY

agst.

JACOB HESS, THEODORE MOSS, DANIEL L. GIBBENS and ABRAM S. HEWITT, Mayor of the City of New York, constituting the Board of Electrical Control for the City of New York, JOHN NEWTON, Commissioner of Public Works for said City, and JOHN RICHARDSON, Superintendent of the Bureau of Incumbrances.

MESSRS. BUTLER, STILLMAN & HUBBARD,

Att'ys for Plaintiff.

WILLIAM ALLEN BUTLER, ESQ.,

THOMAS H. HUBBARD, ESQ., and } *Of Counsel.*

JOHN NOTMAN, ESQ.,

WILLIAM C. TRULL, ESQ.,

Att'y for Defts. Hess, Moss & Gibbens.

WILLIAM N. COHEN, ESQ.,

*Of Counsel.*HENRY R. BECKMAN, *Counsel to the Corporation,**Att'y for Defts. Hewitt, Newton & Richardson.*

W. L. TURNER, ESQ.,

Of Counsel.

LAWRENCE, J.

This is a motion upon the part of the plaintiff to continue during the pendency of the action an injunction restraining the defendants, as follows:

FIRST: From interfering with or removing any of the plaintiff's poles, wires or fixtures in the City of New York.

SECOND: From doing any act or acts tending to give to the Metropolitan Telephone Company, the Western Union Telegraph Company and the East River Electric Light Company, or any other companies, other or greater facilities or privileges than shall be granted to the plaintiff.

A thorough examination of the exceedingly voluminous papers read upon this motion has served to ripen into a conviction the impression which I intimated during the argument, that the plaintiff is not entitled to the injunction which is prayed for in the complaint.

It is quite obvious that under the Act of 1887, Chapter 716, which creates the Board of Electrical Control, the duty and responsibility of determining all questions as to the placing, erecting, constructing, suspension, use, regulation or control of electrical conductors or conduits or subways for electrical conductors in the City of New York are to be determined by said Board.

See Act, Sections 1, 3, 4.

By the first section of said Act, it is provided that:

"From and after the passage of this act and until the first day of November, eighteen hundred and ninety, the board of commissioners of electrical subways, in and for the city and county of New York, heretofore appointed under authority of the act, chapter four hundred and ninety nine of the laws of eighteen hundred and eighty-five, together with the mayor of said city, for the time being, are hereby constituted the board of electrical control in and for the city of New York. * * * * * All the powers and duties conferred or imposed by the said Act, chapter four hundred and ninety-nine, of the laws of eighteen hundred and eighty-five, upon the commissioners appointed thereunder in and for the city of New York, and all the powers and duties heretofore by any law conferred or imposed upon the local authorities of said city, or any of them, in respect to, or affecting the placing, erecting, construction, suspension, maintenance, use, regulation or control of electrical conductors or conduits or subways for electrical conductors in said city are hereby transferred to and conferred and imposed upon, and shall hereafter be exclusively exercised and performed by the said board of Electrical Control, constituted as provided in this act, and its successors as hereinafter provided."

By the third section of said Act it is provided that:

"Whenever, in the opinion of the board hereinafter constituted, in any street or locality of said city a sufficient construction of conduits or subways underground shall be made ready under the provisions of this act, reference being had to the general direction and vicinity of the electrical conductors then in use overhead, the said board shall notify the owners or operators of the electrical conductors above ground in such street or locality to make such electrical connections in said street or through other streets, localities or parts of the city with such underground conduits or subways so specified as shall be determined by the said board, and to remove poles, wires or other electrical conductors above ground and their supporting fixtures or other devices from said street and locality within ninety days after notice to such effect shall be given. This provision is made a police regulation in and for the city of New York, and in case the several owners or operators of such wires and the owners of such poles, fixtures or devices shall not cause them to be removed from such street or locality as required by such notice, it shall be the duty of the commissioner of public works of said city to cause the same to be removed forthwith by the bureau of incumbances upon the written order of the mayor of said city to that effect."

By the fourth section of said Act, it is provided that:

"It shall be unlawful after the passage of this act for any corporation or individual

to take up the pavements of the streets of said city, or to excavate in any of said streets for the purpose of laying under ground any electrical conductors, unless a permit, in writing therefor, shall have been first obtained from the said board, or its predecessor, and except with such permission no electrical conductors, poles or other figures or devices therefor, nor any wires, shall hereafter be continued, constructed, erected or maintained or strung above ground in any part of said city. The said board of electrical control may establish, and from time to time may alter, add to or amend all proper and necessary rules, regulations and provisions for the manner of use and management of the electrical conductors, and of the conduits or subways therefor constructed or contemplated under the provisions of this act, or of any act herein mentioned."

In substance the Court is asked upon this motion to determine that the opinion, which the Board of Electrical Control has formed as to the feasibility of putting the electrical wires under the streets and avenues specified in the resolution of September 21st, 1887, is an erroneous one, and it is asked to substitute its own opinion for that of the Board. In other words, the Court is asked to override the will of the people as expressed in the Act of 1887, that the Board of Electrical Control shall decide when and where and in what manner the wires shall be placed under ground.

On plain principles, this request must be refused.

See High on Injunctions, vol. 2, pp. 813-815, section 1240, where the learned author says: "And no principle of equity jurisprudence is better established than that courts of equity will not sit in review of the proceedings of subordinate political or municipal tribunals, and that where matters are left to the discretion of such bodies, the exercise of that discretion in good faith is conclusive, and will not, in the absence of fraud, be disturbed. And the fact that the Court would have exercised the discretion in a different manner will not warrant it in departing from the rule. * * * * * And where municipal officers are proceeding in the exercise of an unquestioned authority, with the construction of a work of public convenience, they will not be enjoined at the suit of a citizen, seeking to restrain the work upon the particular plan proposed, upon the ground that another and different plan is superior. Thus, the owners of mills and mill privileges upon a river in an incorporated city will not be permitted to enjoin the city authorities from improving or reconstructing a public bridge in accordance with a proposed plan, upon the ground that the plan adopted will cause more injury to complainant's mills than would otherwise accrue since the power to make the improvement necessarily implies the right to determine upon the plan and method of doing it."

See also *People vs. Contracting Board*, 27 N. Y., pp. 378-381.

Howland vs. Eldridge, 43 N. Y., p. 457.

People vs. Fairchild, 67 N. Y., p. 334.

People vs. Leonard, 74 N. Y., p. 443.

People vs. Common Council, 78 N. Y., pp. 33-39.

It is essential that the Board, in arriving at a determination, should be free to act upon the various plans submitted to it untrammelled by the views and opinions of other officers and departments of the government, and no Court should intervene for the purpose of retarding, arresting or preventing the action of the Board, except in cases where fraud or conduct amounting to fraud is shown.

There are allegations in the moving papers which are intended to show that the Board of Electrical Control has been actuated in its proceedings, as respects the plaintiff, by improper motives, but after a full consideration of the attacking and replying affidavits, I do not think that the charge is sustained.

On the contrary, while all charges of fraud or collusion are denied by the defendants, no one, I think, can read the plaintiff's papers without receiving the impression that the plaintiff has determined from the first not to submit to the orders of the Board in respect to the placing of wires under ground unless some plan was adopted by the Board which should be satisfactory, primarily, not to the Board, but to the plaintiff.

So far as the expert evidence is concerned, I deem it sufficient to say, that while the plaintiff has produced the affidavits of many electricians of undoubted capacity and standing, who are of the opinion that the plan adopted by the Board of Electrical Control is not feasible or practicable, the defendants have read in answer numerous affidavits from electricians, both practical and theoretical, of equal standing and experience, endorsing and commending that plan. Upon this state of facts, the wisdom of the Legislature in confiding to the Board the exclusive power to determine upon a proper plan for placing the electric wires under ground is apparent.

See remarks of Ruger, C. J., in *People vs. Squire*, 107 N. Y., at p. 605.

It was contended upon the argument that the Act of 1887 is in conflict with the Constitution of this State. Some of the grounds which are urged are the same as those alleged against the acts of 1884 and 1885, and are disposed of by the decision of the Court of Appeals in the case of the *People ex rel. the New York Electric Lines Company vs. Squire, &c.*, 107 N. Y., p. 593. Indeed, the opinion of the Court in that case is a conclusive answer to most of the points made upon this motion. It is there decided that the Act of 1885 is not in conflict with section 17 of article 3, of the Constitution, because it declares that the Act of 1884 is amended so as to conform to the provisions of the Act of 1885, the former Act not being inserted in the latter. It is also decided that the Act of 1885, so far as it affects corporations organized before its passage, is not obnoxious to the constitutional prohibition against laws impairing the obligation of contracts that it does not annul, destroy or materially impair or restrict any franchises or contract rights previously secured, but seeks to regulate and control their exercises, so that they shall cease to constitute a public nuisance.

At page 603, Chief Justice Ruger, in delivering the opinion of the Court, says: "But we are of the opinion, for other reasons, that this legislation did not, and was not, intended to materially impair or restrict the enjoyment of the franchise secured by the relator. The necessity of these acts sprung out of a great evil, which, in recent times, has grown up and afflicted large cities by the multiplication of rival and competing companies, organized for the purpose of distributing light, heat, water, the transportation of freight and passengers, and facilitating communication between distant points, and which require in their enterprises the occupation not only of the surface and air above the streets, but indefinite space under ground.

"This evil has become so great that every large city was covered with a net work of cables and wires attached to poles, houses, buildings and elevated structures, bringing danger, inconvenience and annoyance to the public. Extensive spaces under ground were also required to lay pipes and build trenches and arches, to transact the business of the various corporations requiring them. These works not only called for great skill to harmonize the various and conflicting claims of competing companies to rights

above as well as beneath the ground, but a comprehensive plan and supervision, to prevent the constant disruption of the streets and the interruption of travel. The necessity of a remedy for these public annoyances had long been felt, and it finally culminated in the enactment of the several statutes referred to. These statutes were obviously intended to restrain and control, as far as practicable, the evils alluded to, by requiring all such wires to be placed under ground in such cities, and be subject to the control and supervision of local officers, who could reconcile and harmonize the claims of conflicting companies, and obviate, in some degree, the evils which had grown to be almost, if not quite, intolerable to the public. The scheme of these statutes was not to annul or destroy the contract rights of such companies, but to regulate and control their exercise. They did not purport to deny them any privileges theretofore granted, but they did require that they should be exercised with due regard to the claims of others, and in such a way that they should cease to constitute a public nuisance, and should be enjoyed in such a manner as to inconvenience and endanger the general public as little as possible."

The Act of 1887 was not considered by the Court of Appeals in the People vs. Squire, but the reasoning, which goes to show that the former acts were not unconstitutional, is equally forcible to sustain the validity of the latter Act.

Precisely, why, the plaintiff in this case can challenge the unconstitutionality of the Act of 1887, because it seeks to validate the contract theretofore made by the Subway Commissioners, I do not understand.

It was competent for the Legislature, in the first instance, to have authorized the Subway Commissioners to make the contract in question, and it seems to me that if the contract was beyond the power of the Commissioners when made, the Legislature could afterwards affirm and ratify it.

Brown vs. The Mayor, &c., 63 N. Y., p. 244, and cases cited.

If, however, there is any reason for doubting that the Act of 1887 is constitutional the doubt is so remote that a justice, sitting at Chambers, would not, upon well established authorities, be justified in entertaining it.

Matter of N. Y. Electrical R. R. Co., 70 N. Y., p. 342.

In that case Earl, J., referring to certain constitutional objections to the General Rapid Transit Act, says: "In considering them, we must keep in view the salutary rule, often reiterated, that nothing but a clear violation of the Constitution will justify a Court in overruling the legislative will. Every statute is presumed to be constitutional, and every intendment is in favor of its validity."

See also Thompson vs. Commissioners, 2 Abb., Pr. p. 248.

The Electric Lines Co. vs. Crimmins, N. Y.

Superior Court, Opinion Freedman, J.

Matter of Lexington Avenue, 63 How. P. R., p. 462.

People vs. Tweed, 63 N. Y., p. 206.

It is further contended by the plaintiff that an unjust discrimination is being made by the Board of Electrical Control between the plaintiff and other companies engaged in the business of electric lighting in the City of New York. The allegations

to that effect in the plaintiff's affidavits, I am constrained to say, are, in my opinion, fully met and answered, but if they are not, the remedy of the plaintiff is not by injunction. Section 7, of the Act of 1887, provides for such a case, and by that section, if the plaintiff is aggrieved, it can, by mandamus, compel the Board to "furnish just and equal facilities" to it, and obtain precisely the same rights as any other corporation or corporations.

It is not necessary to obtain those rights, that an injunction should be granted to the plaintiff, which may entirely thwart all the efforts of the Board, in the matter of putting the electric wires under ground.

There is nothing in the motion to punish the defendants for contempt, which calls for particular observation. The affidavits of the defendants explain, as I think, very satisfactorily, the acts which are alleged to have been in violation of the injunction, and of the plaintiff's rights, and do not, as thus explained, call for the condemnation of the Court.

Finally, I am of the opinion that the whole equity of the plaintiff's case is met, denied and answered by the defendants' papers, and I therefore see no reason for interposing the strong arm of the Court to arrest the progress of a great public work, the speedy completion of which is desirable for the safety and convenience of the people.

The following report of Engineer Kearny was read and ordered to be spread on the minutes:

NEW YORK, January 18th, 1889.

To the Honorable, the Commissioners of the Board of Electrical Control:

GENTLEMEN:—I beg to report that under the direction of your Honorable Board the Consolidated Telegraph and Electrical Subway Company has constructed subways as follows:

For Telegraph and Telephone wires.....	2,287,880	feet of duct
For Electric lighting service.....	316,796	" "
For Edison Incandescent Lighting.....	338,376	" "
or a total of.....	2,943,025	" "

To do this was opened 240,155 lineal feet of trench, or about 45 miles, all of which had been properly filled and repaved in the time required by and under the supervision of the Department of Public Works.

The construction consists of:

Wrought iron pipe laid in hydraulic cement concrete....	1,712,600	feet
Cement and iron pipe laid in hydraulic cement.....	216,600	"
Wrought iron pipe laid in asphaltic cement concrete....	131,300	"
Zinc tubes laid in hydraulic cement concrete.....	68,883	"
Creosoted wood tubes.....	167,200	"
Dorsett asphaltic tubes.....	235,800	"
Edison tubes.....	338,400	"
Johnstone System.....	82,300	"

There have also been constructed :

674 Manholes.
580 Distribution Boxes.
32 Flush Boxes.

The following is the number of miles of electrical conductors in subways at the end of last year :

Met. Tel. & Tel. Co.....	4,062.32 miles
Western Un. Tel. Co.....	39.08 "
Brush Elec. Ill. Co.....	8.87 "
Edison Electric Ill. Co.....	192.23 "
N. Y. City Fire Telegraph.....	101.02. "

In addition to this, the Harlem Lighting Company have placed conductors in the subways on 125th street, from Third to Fourth avenues, and are operating them in connection with the overhead wires running to their station with perfectly satisfactory results.

The construction up to the present time furnishes a complete route of subways for telegraph and telephone service, through Broadway, from the Battery to 58th street, also from Battery to 58th street, by way of Church street, College Place, West Broadway, South Fifth avenue and Sixth avenue; thus affording two lines of subways from the lower part of the city to the Park for those services.

In addition to these, there are subways on many of the cross streets, as shown on the map presented herewith.

For Electric Lighting service there are completed subways on Broadway, from 14th to 58th streets; on Sixth avenue, from 18th to 58th streets, besides on many cross streets, as shown on map No. 2.

The condition of the subways as constructed has engaged the constant attention of myself and the Engineer of the Construction Company, and a regular system of inspection of manholes and subways is in operation.

The materials used and the manner of construction have been amply justified by the result and warrants the statement made by many Electrical and Mechanical Experts who have interested themselves in our operations that the subways in this city are the best constructed in the world.

The only drawback of any importance which has been met with is in the lower part of the city, on Broadway and Church street, where the operations of the Steam Heating Company have seriously interfered with the insulation of the cables placed in the subways.

The Steam Heating Company have done and are doing all in their power to repair the defective pipes, and have had some degree of success in reducing the temperature of the earth at the subway manholes. They are anxious to continue this, and are apparently sparing no expense.

I am endeavoring to ascertain from the various Electrical Companies such information as will enable me to formulate a plan of construction for this year, and will lay same before you at as early a date as possible.

Very respectfully,

HENRY S. KEARNY, Engineer.

Commissioner Hess offered the following resolution:

Resolved, That the application of the Brush Electric Illuminating Company, dated January 15, 1889, to string wires on condemned pole line of Western Union Telegraph Company on Avenue A, from Essex street to 23d street, agreeing therein to abandon its own pole line on that Avenue between those points, be denied.

Unanimously adopted.

Commissioner Gibbens stated that Inspector Keyes reports, in the case of an application of the Western Union Telegraph Company to erect an office pole in front of its 386 West street office to replace pole broken down, that there is no broken pole at that point. The Commissioner offered the following resolution:

Resolved, That the application of the Western Union Telegraph Company, dated January 14, 1889, to erect a pole in front of its 386 West street office to replace a pole broken down at that point, be denied.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated January 9, 1889, to substitute a new pole for the old one now standing at 115 Marion street, be referred to the Expert, and that he be directed to report at the next meeting whether such pole is necessary at that point.

Unanimously adopted.

Commissioner Hess offered the following resolution:

Resolved, That the application of the Manhattan Electric Light Company, dated January 15, 1889, to set one guide pole on the south side of 80th street, west of Third avenue, be denied.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of C. A. Blanchard & Co., dated January 14, 1889, to erect two electric lampposts on the west side of 36th street, about 150 feet west of Broadway, in front of the Hotel Marlborough, be referred to the Expert, and that he be requested to report as to the willingness of the applicants, in case the permission is granted, to keep the lamps lighted all night as city lamps are kept lighted.

Unanimously adopted.

The Board took up the consideration of a communication of the Harlem Lighting Company, dated January 18, 1889, referring to its application to erect a pole line on Third avenue, from 32d to 86th streets, and, after some discussion, Commissioner Gibbens offered the following resolution:

Resolved, That all the applications now before the Board for pole routes be laid on the table until the next meeting of the Board.

Unanimously adopted.

Mayor Grant stated that he had received a communication from Messrs. Butler, Stillman & Hubbard, Attorneys for the United States Illuminating Company, addressed to him personally, that a member of that firm was present by his invitation, and if that gentleman had no objection he would present the communication to the Board. The gentleman referred to expressing his willingness in respect thereto, the communication was read, and is as follows:

NEW YORK, January 16th, 1889.

HON. HUGH J. GRANT, Mayor of the City of New York:

DEAR SIR:—We address you on behalf of our client, the United States Illuminating Company, to ask your consideration of the facts relating to its position in view of recent action of the Board of Electrical Control and of the Department of Public Works.

As you are aware the Board of Electrical Control claims to have provided a sufficient subway in a certain part of this City and have notified the U. S. Illuminating Co. to place its wires therein and to remove its overhead system, and the Department of Public Works also requires the Company to remove its poles and wires in other parts of the City where no subway has been provided, claiming that such wires are what are called "dead" wires.

Very grave questions of law and fact are involved in this matter. Suits are pending between the Mayor, Aldermen and Commonalty of the City of New York and the U. S. Illuminating Company and between the Company and the Board of Electrical Control in which these questions are raised and both suits have been set for trial and are expected to be tried next week in the Special Term of the Supreme Court.

It is proper for us to say that your distinguished predecessor in office, ex-Mayor Hewitt, was of the opinion, as repeatedly and publicly expressed by him, notably in his address before the Electrical Convention in this City, in August last, that the subways provided by the Board of Electrical Control were entirely insufficient for wires for electric lighting purposes, and furthermore that no system of distribution of currents had been provided, and he accordingly refused to grant any order for the removal of the overhead poles and wires of Electric Light Companies.

The fact is that the situation has not in any manner changed, and that no electric light companies have placed, or have been compelled to place, their wires in the so-called subways, save that the Brush Illuminating Company has experimentally laid about a mile of cable in the subway some months ago, but have never been able to get any circuit through or to make any use of the same, and their tests have shown that the electric current cannot be carried through the subway.

The U. S. Illuminating Company has a very extensive and valuable property employed in lighting the City in various districts to the entire satisfaction of the public and of its many private customers, and is regarded by the Police as furnishing the most important aid in protecting public order and private property. It supplies in the subway district many leading places of public resort such as Delmonico's, Hotel Bruns-

wick, the Gilsey House, the Sturtevant House, the Coleman House, the Victoria Hotel, the Union and Lotos Clubs and other hotels, clubs and public buildings. It is ready and willing, and always has been, to obey all the requirements of the law and to place its wires underground as soon as a proper subway is provided, but has been so dealt with by the Board of Electrical Control as to be obliged to resort to the Court for protection, especially against the unfair and injurious discrimination against it in favor of rival companies, which has been exercised, and which has for its apparent object the forcing of its system underground, while in the meantime permits have been and are now continually granted for poles and wires overhead to other companies in all parts of the City, and especially over the very district in question.

In view of these facts, which we are prepared to prove, and which will be given in evidence at the approaching trials, we respectfully ask that you will take no action which will change the situation as now existing, or pending the trial and determination of the questions involved. The removal of the poles and wires of the U. S. Illuminating Company by force will destroy the private property of the Company and work irreparable damage to citizens who have invested large sums in the effort to provide a system of electric lighting, without securing any advantage to the public. In any event we solicit a hearing before you shall take any action adverse to the Company.

We beg, in closing, to say that the U. S. Illuminating Company will put a cable in the subway without delay, at its own expense, of sufficient length to make a fair test of the practicability of using it—its poles and wires to remain as now, the same as those of all the other electric light companies.

We are with great respect,

Your obt. servts,

BUTLER, STILLMAN & HUBBARD,

Attorneys for the United States Illuminating Co.

Mayor Grant—When that communication was received by me I communicated with that firm, and said that I was satisfied that any action that was taken by this Board would not be detrimental to the United States Illuminating Company's interest and that all companies would be treated alike. I asked the representative of that firm to be present, so that he could see just what this Board did in the matter. I do not know whether any application has been made or what is the sense of the Board as to allowing the United States Company to lay a mile of wire, so that it can be tested

Commissioner Gibbens stated that there were false statements in the communication of Messrs. Butler, Stillman & Hubbard, and he enumerated them.

The member of the firm of Butler, Stillman & Hubbard suggested to the Board a joint conference between the Board's Expert and the Expert of the United States Illuminating Company, in the matter of placing a cable in the subway.

Commissioner Gibbens suggested as a substitute for the proposal of the member of the firm of Butler, Stillman & Hubbard the following resolution:

Whereas, At a regular meeting of the Board of Electrical Control, held November 13th, 1888, the following resolution was passed:

Whereas, In the opinion of this Board a sufficient construction of conduits or subways underground has been made ready, reference being had to the general direction and vicinity of the electrical conductors in use overhead in the following streets and localities of the city, to wit:

For Telegraph and Telephone Conductors:

- Broadway, from Bowling Green to Fifty-eighth St.
- New Church street, from Exchange Alley to Barclay street.
- Barclay street, from Church street to College Place.
- College Place, from Barclay to Chambers streets.
- West Broadway, from Chambers to Canal streets.
- South Fifth avenue, from Canal to Fourth streets.
- Fourth street, from South Fifth to Sixth avenues.
- Sixth avenue, from Fourth to Fifty-eighth streets.
- Eighth avenue, from Forty-second to Fifty-eighth streets.
- Madison avenue, from Twenty-third to Fifty-ninth streets.
- Lexington avenue, from Fifty-eighth to Sixty-fifth streets.
- Spring street, from Broadway to West street.
- Houston street, from Broadway to Chrystie street.
- Houston street, from Green to Bedford streets.
- Eighteenth street, from First to Seventh avenues.
- Twenty-third street, from Broadway to Madison avenue.
- Thirty-eighth street, from Lexington to Sixth avenues, and Broadway to Eighth avenue.
- Forty-second street, from Broadway to Madison avenue.
- Forty-fifth street, from Vanderbilt to Eighth avenues.
- Fifty-eighth street, from Third to Eighth avenues.
- Battery Place, from Greenwich street to Bowling Green, along Bowling Green to Whitehall street, along Whitehall street to Pearl street.
- Stone street, from Whitehall street to Hanover Square.
- Broad street, from Water street to Exchange Place, through Exchange Place from Broad to New Church streets.
- William street, from Exchange Place to Front street, along Front to Gouverneur street.
- Pearl street, from Hanover Square to Beaver street.
- Maiden Lane, from Front street to Broadway and Cortlandt, along Cortlandt to West street.
- John street, from Nassau to Front streets.
- Nassau street, from John to Ann streets, along Ann to Gold street, along Gold to Beekman streets.

Frankfort street, from Park Place to Pearl street.
Park Row, from Ann to New Chambers streets.
Centre street, from Duane to Worth streets, along Worth to Chatham Square and New Bowery, and along New Bowery to Chambers street.

For Arc Light and Power Conductors:

Sixth avenue, from 18th to 59th streets.
Broadway, from 14th to 58th streets.
19th street, from Broadway to Fifth avenue, and from Fifth to Sixth avenues.
21st street, from Broadway to Fifth avenue.
23d street, from Fourth to Sixth avenues.
24th street, from Broadway to Sixth avenue.
25th street, from Broadway to Sixth avenue.
26th street, from Broadway to Sixth avenue.
27th street, from Madison to Broadway, and Broadway to Sixth avenue.
28th street, from Fifth to Eighth avenues.

therefore be it

Resolved, That the Secretary be directed to notify the owners or operators of the electrical conductors above ground in such streets or localities, to make such electrical connections in said streets with such underground conduits or subways as may be necessary to the proper transaction of their business, and to place electrical conductors for the transaction of their business in the said conduits, and to remove poles, wires or other electrical conductors above ground and their supporting fixtures, or other devices, from the said streets and localities within ninety days after the receipt of this notice. And said companies are further notified to submit plans of said electrical connections hereby authorized, together with modifications of, or additions to, said conduits necessary, or deemed so to be, for making the same, to this Board, within ten days, or as soon thereafter as possible, so that this Board may cause the said modifications or additions to be made, if they appear to be proper and necessary and, in case the said suggestions for the modification of, or additions to, said conduits are not submitted to the Board, or do not appear to the Board to be proper and necessary, the following methods are designated by the Board for the making of the said electrical connections in the said streets: For electric light and power conductors, subsidiary iron tubes from the nearest manhole in said subway to the point desired to be reached, and through said iron tubes insulated wires or cables, connecting the lights, machinery or termini of overhead lines with electrical conductors in the said conduits. For other service, subsidiary pipes or boxes either of wood or iron, extending from the nearest manhole to the point desired to be reached, with insulated conductors connecting the instruments or termini of overhead routes with the wires in the said conduits. The Consolidated Telegraph and Electrical Subway Company is authorized and directed to construct said subsidiary ducts or boxes, at such places as shall be desired by companies notified to use the subways as above, upon the application of such companies.

And Whereas, the said notices were duly sent to the companies operating electrical conductors upon said streets and avenues.

And Whereas, the ninety (90) days of notice required by law for the placing of the wires of said electrical companies underground and the removal of poles and wires from the surface of the streets will expire on the 20th day of February, 1889.

And Whereas, it becomes proper upon that day for the Mayor of the City of New York to order the Commissioner of Public Works to remove the poles and wires of such companies as shall have failed to comply with such notice.

And Whereas, it is the purpose and policy of this Board to request the Mayor to take said action in all cases where companies have not shown due diligence in attending to such notice; therefore,

Resolved, That the Secretary be directed to transmit to the several electrical companies the following letter:

To the President of the Company:

DEAR SIR:—On the day of November, 1888, a notice was addressed to you requesting you to place your electrical conductors underground in streets and avenues where subways have been provided, in the opinion of the Board of Electrical Control sufficient, and to remove your poles and wires from the said streets and avenues within ninety (90) days from the date of the said notice; and the ninety (90) days mentioned in the said notice will expire on the 20th day of February, 1889.

I am directed by the Board of Electrical Control to request that you will upon the receipt of this letter furnish the Board with full information regarding your compliance with the said notice; that you will state what your Company has done, if anything, towards the placing of its electrical conductors underground and the removal of poles and wires from the surface of streets in each street and avenue mentioned; whether you will be fully prepared to operate your electrical conductors in the said streets and avenues underground at the expiration of the ninety (90) days of notice and remove your poles and wires therefrom; and, if not, what length of time you require to convert your overhead system to an underground system in each street and avenue; it being the purpose and policy of the Board of Electrical Control to request the Mayor to order the Commissioner of Public Works to remove your poles and wires from the surface of the streets and avenues mentioned in cases where companies operating said poles and wires, and being in receipt of said notice, do not show due diligence in complying therewith.

THEODORE MOSS, Secretary of the Board of Electrical Control.

Commissioner Gibbens: I desire to get plainly before the Board, on record in writing, every company which is required to place its conductors underground, and when we receive replies to this communication the President will have full information as to the standing of each company and what it is doing.

Commissioner Hess, after some discussion, offered the following resolution:

Resolved, That our Expert be directed to confer with the Expert of the United

States Illuminating Company, in relation to the application this day made by Messrs. Butler, Stillman & Hubbard, the Attorneys for and representatives of the United States Illuminating Company, and that these Experts make investigations and tests of the kinds of cable or wire proposed to be placed underground, and that our Expert report to the Board the character of the proposed cables or wires and the length of time necessary for the completion of the same, it being understood that it shall be done as speedily as possible.

Unanimously adopted.

Commissioner Gibbens thereupon formally offered the resolution immediately preceding the last, and which was suggested by him as a substitute to the proposal of the member of the firm of Butler, Stillman & Hubbard.

Mayor Grant stated that there were recitals in the resolution of Commissioner Gibbens, the truth of which could only properly be ascertained by an examination of the minutes. He would, therefore, decline to vote.

Commissioner Hess offered the following resolution:

Resolved, That the resolution offered by Commissioner Gibbens be laid over until the Mayor becomes familiar with the facts recited in it.

Unanimously adopted.

Expert Wheeler presented and read the following Report, which the Board ordered to be spread on its minutes:

NEW YORK, January 17th, 1889.

The Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN:—I have to report the following as the work accomplished during the month since the last statement, of December 15th, as the result of the proceedings of your Board.

The first arc lights operated by underground conductors in New York have been started by the Harlem Electric Light Company and are now running successfully. The conductors connecting these lights are Bishop's gutta percha covered cables such as could be found ready in the market, and are single conductor cables according to the recommendation of the Board. They are laid in the Johnstone conduits on 125th street, from Third to Lexington avenues, and are connected with the station by overhead wires of the ordinary kind. The overhead wires are connected to the cables at the top of the lamppost, and the cables are carried down the lamppost, under the curbstone and into the conduit through an ordinary iron pipe set in the post. The house connections are made through iron pipes running from the conduit under the sidewalk and up the front of the building in an inconspicuous place. The tests of the underground cable and of the overhead connections showed very high insulation, and the whole is working very satisfactorily.

The eight-conductor cable laid for the Brush Company, from 14th to 35th streets, has been tested and the insulation of the joints very much improved. This cable,

which had an insulation of itself very much in excess of the standard required, was found to have a lower insulation when connected up, in consequence of slight moisture reaching the joints before they were covered up during the rainy weather. This has been overcome by simply warming and drying the joints, and now it has an insulation of 50 megohms for the entire length of one mile, and while the Company having the matter in charge propose to carry the improvement still further, the cable is already in extremely good condition and perfectly suitable for carrying high pressure currents. In fact, such currents could not now be put on the cable with perfect safety even if it had only one-quarter of its present insulation, notwithstanding statements made by the press that it is a failure.

The Fire Department are actively engaged in drawing in cables on Broadway and connecting all their signal boxes underground.

The Western Union Telegraph Company are having cables made for Broadway and Sixth avenue, which, when laid, will permit the removal of all their poles on Broadway and on Sixth avenue, from 14th to 59th streets. They hope to have these cables completed and in position in about one month. The Western Union Company have also, as a result of notices from your Board, removed two lines of poles running through 46th street, from Eighth to Fourth avenue. On this street there were three lines of poles erected by competing telegraph companies, the consolidation of which with the Western Union reduced the condition of several lines of poles through one street owned by one telegraph company, a condition existing also for the same cause in a great many streets, and to which the work of your inspectors is being directed.

A large number of dead poles and dead wires have been removed by the Bureau of Incumbrances, including two abandoned lines from 55th street to the neighborhood of the City Hall, through Second and First avenues, respectively.

Up to within a few days no action has been taken by the Bureau of Incumbrances upon the complaint against the U. S. Illuminating Company, aggregating 191 notices, as a result of various letters from this Company to the Bureau and an injunction from the court. This injunction having been vacated, your Electrical Expert called upon the Commissioner of Public Works and requested him to act upon these cases. First, because the dead poles and wires of all other companies having been removed and no action having been taken upon those of the United States Company, this, if allowed to continue, would constitute an unfair discrimination against the other companies and in favor of the United States Company. And, second, because the overhead work of the United States Company being notoriously bad and dangerous, and the worst in the city, is a discredit to the city, and to all having authority in the matter. To which the Commissioner replied promptly that he would cause these cases to be acted upon at once. Immediately after this your Expert learned that the United States Company had expressed their intentions, in writing, to make all the removals called for in the notices themselves, commencing yesterday, in order to save their wires and fixtures.

During the past month your inspectors have reported 828 violations of the Rules and Regulations, which have been reported to the proper owners by 79 notices sent to the Companies and 131 notices sent to the Bureau of Incumbrances, all of which are given in detail in the usual monthly schedule submitted herewith.

The subject of explosive illuminating and other gases entering the subways from the surrounding earth has received considerable attention and a number of good plans for remedying the difficulty has been suggested. It is suggested to keep the air

filling the conduit at a slight pressure in excess of the external pressure by means of small blowers applied at one or more points of the system. The purpose of this is to change the direction of the slow leakage of gas through the walls of the man-holes. So that instead of gases gradually coming through the surrounding earth the air will slowly escape from the manhole into the earth or else hold the gases in check. It is thought that a very slight pressure of perhaps a quarter of a pound to the square inch similar to the pressure of gas in the gas mains, which is inexpensive to maintain, will be sufficient for this purpose. When a manhole is opened for making connections, the circulation of the air through the connecting tubes to other manholes will be so slow that it will not seriously reduce the pressure of the system, particularly if all but one or two of the tubes are plugged. Another plan which has been suggested is to fill the entire system of subways with carbonic acid gas, the material which is used in portable fire extinguishers. This has the great advantage that it will effectively prevent the formation of explosive mixtures, will prevent the communication of fire, and will, in fact, extinguish any fire, as is well known.

Very respectfully,

SCHUYLER S. WHEELER, Electrical Expert for the Board.

Commissioner Gibbens—There are some communications before the Board from the Fire Department to the effect that certain electrical companies in their construction have interfered with the wires of the Fire Department; and the letters also state that the Fire Department had no notice of this construction and they would like to have notice of construction when any is made in the future. I have communicated with the Superintendent of the Fire Department myself. I have also communicated with the companies with a view to stop this interference with the wires of the Fire Department. I offer the following resolution:

Resolved, That the communications from the Fire Department, dated respectively January 10th, 11th, 16th and 18th, 1889, be referred to a committee of one to be appointed by the Chair, and that at the next meeting some plan be formulated by which it will be assured that no such interference with the wires of the Fire Department as those complained of in these communications will take place in the future.

Unanimously adopted.

Mayor Grant appointed Commissioner Gibbens the committee under the last resolution.

The following communication received by Mayor Grant was presented to the Board and read:

NEW YORK, January 17, 1889.

HONORABLE HUGH J. GRANT, Mayor:

SIR:—We again renew the proposition of the Citizens' Electric Light Company made to the Board of Electrical Control during the term of your predecessor, but not acted upon, offering a percentage of gross receipts and security stated in our proposal for the franchise and privilege of furnishing electric light and power in the streets

of New York. What we ask is the usual franchise precisely such as has recently been granted other companies.

So confident are we of our ability that we do not hesitate to compete with the old companies and antiquated apparatus at some disadvantage, yet we are unwilling to compete at the same disadvantage with future companies using new and improved apparatus and future inventions, and, therefore, we wish protection to the extent that succeeding companies shall be taxed at least as much as we, and not a fictitious compensation as heretofore.

For bondsmen we offer two New York City real estate owners.

Yours truly,

CHARLES B. PAGE, Pres.

Commissioner Gibbens stated in reference to the communication of the Citizens' Electric Light Company that its application had, with two or three others of a like nature, been referred to him as a committee to report at a future meeting of the Board.

Mayor Grant—there being no objection—referred the communication of the Citizens' Electric Light Company to Commissioner Gibbens.

Commissioner Hess offered the following resolution:

Resolved, That the Board adjourn subject to the call of the Chair.

Unanimously adopted.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday, February 15th, 1889, at 12 o'clock, noon.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Commissioner Moss laid before the Board the various applications for permits from the different electrical companies.

Mayor Grant stated, in reference to these applications, that he preferred to have Commissioner Gibbens present before acting upon them, and suggested an early meeting when a full Board might be present.

The Board unanimously agreed to lay over these applications.

Mayor Grant—I would like to inquire from our own Expert what progress he is

making with that test of the cable of the United States Illuminating Company proposed to be placed underground.

Expert Wheeler—I have just received a letter from the United States Illuminating Company, stating that they have closed a contract with one of the cable manufacturers and have ordered about three miles of cable of a suitable style in the conduits, and a letter that the Cable Company guarantees to have the whole work completed in fifty-five days.

Mayor Grant stated that it was the understanding of the Board that the work would not take so much time as that, and questioned Expert Wheeler and Engineer Kearny in respect to the time required for the purpose.

After some discussion the Board, upon the suggestion of Mayor Grant, directed Expert Wheeler to take the matter in hand at once, so that at the next meeting of the Board he could give it a positive assurance as to the time necessary to complete the work.

The following communication was read and ordered to be spread on the minutes:

NEW YORK, February 6, 1889.

HON. THEODORE MOSS, Secretary Board of Electrical Control, City:

DEAR SIR:—I beg to inform you that the operation of our cables in the subways on 125th street, between Third and Lexington and Lexington and Fourth avenues, has enabled this Company to remove all its carrying poles on the north side of 125th street between said avenues, as follows:

- 2 poles at 125th St. and Third avenue.
- 1 pole at 125 East 125th St.
- 1 pole at 137 East 125th St.
- 1 pole at 167 East 125th St.
- 1 pole at 175 East 125th St.

A total of six poles on two blocks.

The cables referred to have been operated continuously since January 11th of this year, with the most satisfactory results, and we regard their use to be not only permanent, but economical and desirable, and shall extend our underground service in that locality and in all other localities in this city as rapidly as subways are provided.

With reference to the subways on Sixth avenue, between 18th and 58th streets, and Broadway, between 14th and 58th streets, I have the honor further to inform you that we are now busily engaged in drawing into those subways over 40,000 feet of cable, and expect to have the same in successful operation within three weeks, immediately after which still further important extensions of our proposed underground system will follow.

In connection with the above, I deem it fair to state that to "The Manhattan Electric Light Company (Limited)" belongs the credit of having established in this city and successfully operated the first underground high tension electric light circuit.

I have the honor to be, Sir,

Yours very respectfully,

E. A. LESLIE,

General Manager Manhattan Electric Light Company (Limited).

The Board directed that the request of Mr. C. H. Closson, of 913 Howard avenue, Altoona City, Pennsylvania, contained in a communication to it by him, for a copy of the Rules and Regulations of the Board, be complied with.

Commissioner Hess offered the following resolution :

Resolved, That the Board adjourn until Monday, February 18th, 1889, at 12 o'clock M.

Unanimously adopted.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Monday, February 18th, 1889, at 12 o'clock, noon.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant offered the following resolutions :

Resolved, That no permits be granted by the Board of Electrical Control except in open meeting of the Board.

Unanimously adopted.

Resolved, That all permits heretofore granted by the Board of Electrical Control, not acted upon, or the work to be done under, which is not yet complete, be from this date revoked.

Unanimously adopted.

Commissioner Hess had read, by way of suggestion in regard to the various applications of electrical companies before the Board, the following resolutions :

Whereas, It is the determination of this Board that all overhead wires shall be placed underground at the earliest practicable moment :

Resolved, That notice be sent by the Secretary of this Board to all companies using overhead electrical conductors in this city that hereafter no permits for extension of their lines, or for the erection of new poles, or the substitution of new for old poles, will be granted by this Board, unless it can be conclusively shown to the satisfaction of the Board that the denial of such applications will seriously inconvenience the public, or operate to prevent the proper carrying on of the business of the company making such application.

Be it further Resolved, That the Engineer and Expert of this Board be called upon to report at the next meeting of the Board, upon each and every application for permits for stringing overhead conductors now before the Board, with a detailed report in respect to each as to whether an imperative necessity exists for the granting of such permits.

And, be it further Resolved, That the Engineer and Expert of this Board be instructed that in the examination of new applications for permits for overhead conductors, now or hereafter presented, they shall consider the present condition of the streets or avenues through which said overhead conductors are asked to be erected; and whenever it seems feasible to construct in such streets or avenues subways for the use of such conductors now existing in said streets or avenues, or hereafter applied for, that they shall report to this Board such condition.

And, be it further Resolved, That a copy of these resolutions be sent forthwith to each company operating and using electrical conductors.

Commissioner Hess asked that his resolution be laid over. The Board so directed.

Mayor Grant offered the following resolution:

Resolved, That it is the sense of this Board that it grant no permits for what are called trunk lines, unless as a part of the subway system.

Unanimously adopted.

Commissioner Hess offered the following resolution:

Resolved, That all of the various applications from the different electrical companies now before the Board be referred to the Expert and the Engineer, to report at the next meeting, in writing, as to the necessity and desirability of the granting of these permits.

Unanimously adopted.

Mayor Grant called on Expert Wheeler to make his report as to the test of the cable of the United States Illuminating Company proposed to be placed underground.

Expert Wheeler stated to the Board that he had made inquiries of the different manufacturers of cables for underground service, and that he was of the opinion that no company could furnish a cable quicker than the Standard Cable Company, from which Company the cable had already been ordered. This Company had telegraphed that it could cut the time of its delivery from fifty-five to forty-five days. Another Company, however, which had no cable in stock, had said it could furnish the cable in thirty days.

A representative of that Company was present by his invitation.

Commissioner Gibbens called up the following resolution, which had been laid on the table at a previous meeting of the Board, and offered it:

Whereas, At a regular meeting of the Board of Electrical Control, held November 13th, 1888, the following resolution was passed:

Whereas, In the opinion of this Board, a sufficient construction of conduits or subways underground has been made ready, reference being had to the general direction and vicinity of the electrical conductors in use overhead in the following streets and localities, to wit:

For Telegraph and Telephone Conductors:

Bowling Green, from Bowling Green to Fifty-eighth street.
New Church street, from Exchange Alley to Barclay street.
Barclay street, from Church street to College Place.
College Place, from Barclay to Chambers street.
West Broadway, from Chambers to Canal streets.
South Fifth Avenue, from Canal to Fourth streets.
Fourth street, from South Fifth to Sixth avenues.
Sixth avenue, from Fourth to Fifty-eighth streets.
Eighth avenue, from Forty-second to Fifty-eighth streets.
Madison avenue, from Twenty-third to Fifty-ninth street.
Lexington avenue, from Fifty-eighth to Sixty-fifth streets.
Spring street, from Broadway to West street.
Houston street, from Broadway to Chrystie street.
Houston street, from Green to Bedford streets.
Eighteenth street, from First to Seventh avenues.
Twenty-third street, from Broadway to Madison avenue.
Thirty-eighth street, from Lexington to Sixth avenues, and Broadway to Eighth avenue.
Forty-second street, from Broadway to Madison avenue.
Forty-fifth street, from Vanderbilt to Eighth avenues.
Fifty-eighth street, from Third to Eighth avenues.
Battery Place, from Greenwich street to Bowling Green, along Bowling Green to Whitehall street, along Whitehall street to Pearl street.
Stone street, from Whitehall street to Hanover Square.
Broad street, from Water street to Exchange Place, through Exchange Place from Broad to New Church streets.
William street, from Exchange Place to Front street, along Front to Gouverneur street.
Pearl street, from Hanover Square to Beaver street.
Maiden Lane, from Front street to Broadway and Cortlandt, along Cortlandt to West street.
John street, from Nassau to Front streets.

Nassau street, from John to Ann streets, along Ann to Gold street, along Gold to Beekman street.

Frankfort street, from Park Place to Pearl street.

Park Row, from Ann to New Chambers streets.

Centre street, from Duane to Worth streets, along Worth to Chatham Square and New Bowery, and along New Bowery to Chambers street.

For Arc Light and Power Conductors:

Sixth avenue, from 18th to 19th streets.

Broadway, from 14th to 58th streets.

19th street, from Broadway to Fifth avenue, and from Fifth to Sixth avenues.

21st street, from Broadway to Fifth avenue.

23d street, from Fourth to Sixth avenues.

24th street, from Broadway to Sixth avenue.

25th street, from Broadway to Sixth avenue.

26th street, from Broadway to Sixth avenue.

27th street, from Madison avenue to Broadway, and Broadway to Sixth avenue.

28th street, from Fifth to Eighth avenues;

therefore, be it

Resolved, That the Secretary be directed to notify the owners or operators of the electrical conductors above ground in such streets or localities to make such electrical connections in said streets with such underground conduits or subways as may be necessary to the proper transaction of their business in the said conduits, and to remove poles, wires or other electrical conductors above ground and their supporting fixtures, or other devices, from the said streets and localities within ninety days after the receipt of this notice. And said companies are further notified to submit plans of said electrical connections hereby authorized, together with modifications of, or additions to, said conduits necessary, or deemed so to be, for making the same, to this Board, within ten days, or as soon thereafter as possible, so that this Board may cause the said modifications or additions to be made, if they appear to be proper and necessary; and, in case the said suggestions for the modification of, or additions to, said conduits are not submitted to the Board, or do not appear to the Board to be proper and necessary, the following methods are designated by the Board for the making of the said electrical connections in the said streets: For electric light and power conductors subsidiary iron tubes from the nearest manhole in said subway to the point desired to be reached, and through said iron tubes insulated wires or cables, connecting the lights, machinery or termini of overhead lines with electrical conductors in the said conduits. For other service, subsidiary pipes or boxes, either of wood or iron, extending from the nearest manhole to the point desired to be reached, with insulated conductors connecting the instruments or termini of overhead routes with the wires in the said conduits. The Consolidated Telegraph and Electrical Subway Company is authorized and directed to construct said subsidiary ducts or boxes

at such places as shall be desired by companies notified to use the subways as above, upon the application of such companies.

And whereas, the said notices were duly sent to the companies operating electrical conductors upon said streets and avenues.

And whereas, the ninety (90) days of notice required by law for the placing of the wires of said electrical companies under ground and the removal of poles and wires from the surface of the streets will expire on the 20th day of February, 1889.

And whereas, it becomes proper on that day for the Mayor of the City of New York to order the Commissioner of Public Works to remove the poles and wires of such companies as shall have failed to comply with such notice.

And whereas, it is the purpose and policy of this Board to request the Mayor to take said action in all cases where companies have not shown due diligence in attending to such notice; therefore,

Resolved, That the Secretary be directed to transmit to the several electrical companies the following letter:

To the President of the Company:

DEAR SIR:—On the day of November, 1888, a notice was addressed to you requesting you to place your electrical conductors underground in streets and avenues where subways have been provided in the opinion of the Board of Electrical Control sufficient, and to remove your poles and wires from the said streets and avenues within ninety (90) days from the date of the said notice; and the ninety (90) days mentioned in the said notice will expire on the 20th day of February, 1889.

I am directed by the Board of Electrical Control to request that you will upon the receipt of this letter furnish the Board with full information regarding your compliance with the said notice; that you will state what your Company has done, if anything, towards the placing of its electrical conductors underground and the removal of poles and wires from the surface of streets in each street and avenue mentioned; whether you will be fully prepared to operate your electrical conductors in the said streets and avenues underground at the expiration of the ninety (90) days of notice and remove your poles and wires therefrom; and, if not, what length of time you require to convert your overhead system to an underground system in each street and avenue; it being the purpose and policy of the Board of Electrical Control to request the Mayor to order the Commissioner of Public Works to remove your poles and wires from the surface of the streets and avenues mentioned in cases where companies operating said poles and wires, and being in receipt of said notice, do not show due diligence in complying therewith.

Very respectfully,

THEODORE MOSS, Secretary of the Board of Electrical Control.

Unanimously adopted.

Commissioner Gibbens asked, in reference to the applications for franchises heretofore referred to him, for permission to bring in a report setting forth the state of the

law on the subject and what action has been previously taken under it. The Board granted the permission requested.

Commissioner Gibbens offered the following resolution:

Resolved, That when this Board adjourns it adjourns to meet on Monday next, at 12 o'clock, M.

Unanimously adopted.

Commissioner Hess offered the following resolution:

Resolved, That the Board of Police be notified that there are no permits of the Board of Electrical Control now in force for the erection of poles or the stringing of wires.

Unanimously adopted.

On motion of Commissioner Moss, the Board adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Monday, February 25th, 1889, at 12 o'clock, noon.

Present: Mayor Hugh J. Grant, President; Commissioner Jacob Hess, Commissioner Daniel L. Gibbens, Commissioner Theodore Moss.

The minutes of the previous meeting were read and approved.

The following communications were read:

NEW YORK, February 25, 1889.

To the Honorable Board of Electrical Control.

GENTLEMEN:—I enclose you herewith the report of the General Manager in reply to yours of the 18th inst., for your information.

Yours truly,

THEO. N. VAIL, President

THE METROPOLITAN TELEPHONE AND TELEGRAPH COMPANY,

18 CORTLANDT STREET.

OFFICE OF THE GENERAL MANAGER OF

The Metropolitan Telephone and Telegraph Company, 18 Cortlandt, Street.

NEW YORK, February 23d, 1889.

T. N. VAIL, Esq., President:

DEAR SIR:—In reply to the letter of the Board of Electrical Control of February 18th, in reference to their former notice of November 19th last, notifying us that all this

Company's wires and poles, in the streets and avenues of this city, where subway facilities have been provided, should be removed within ninety (90) days; and asking the reason of our non-compliance, I beg to make the following statement:

In the first place, there has been no lack of energy displayed, nor expense incurred, on the part of this Company, to comply with the above order.

As a matter of fact the Company has to-day more underground wires in service than all the other wire companies in this City combined; to say nothing of the large number of wires we are cutting into service as rapidly as possible. In short, ninety per cent. (90%) of the underground wire mileage in service to-day in this City is the property of this Company.

The number of poles removed from the streets of this City during the year 1888 carrying the wires of this Company, said poles being taken down by us or by the Bureau of Incumbrances numbered fully (200) two hundred; the wire mileage removed during the same period amounting to no less than (700) seven hundred miles.

As an evidence of good faith on the part of this Company, in endeavoring to comply with the order, I would call attention to the fact that we have drawn into the ducts of the underground system, during the year 1888 (46) forty-six miles of 100 conductor cables, representing a wire mileage of 4,600 miles; the cost of the cable alone amounting to \$140,640.54. In addition to the cables drawn in, we now have orders for (10) ten miles in the manufacturers' hands. There is more or less delay in the delivery of this cable in consequence of the large number of orders they have in hand.

Another, and probably the greatest source of delay in preparing the wires of the cables, after having been drawn into the ducts, is in the splicing of the same. We cannot put in a large force to splice any one cable, for the reason that the wires are in metallic circuit, and each and every wire at each and every joint needs testing out, and the parallelism maintained, from one end of the cable to the other; thus making it impossible for more than (1) one or (2) two splices to be made on the one cable at the same time.

It is considered quick work for one splice to be made per day in any one manhole.

The work of concentrating our wires (a no very easy task) in order to connect with the subways is progressing as rapidly as possible; but at best it is slow work, in consequence of the necessity of securing rights of way, roof privileges, etc., for distributing terminals and work of like nature.

Taking all the circumstances into consideration, it was, and is, an impossibility to comply with the notice of the Board of Electrical Control to remove our wires and poles in the time specified in their order of November 19th, 1888.

The Board of Electrical Control ask, how much time it will require before all our wires and poles can be removed from the streets and avenues in which subways have been placed.

This is a difficult question to answer, but sufficient it is to say—judging the future by the past—it will require many months.

Yours truly,

W. H. ECKERT, Gen'l Manager.

THE UNITED STATES ILLUMINATING COMPANY,
59 & 61 LIBERTY STREET,
NEW YORK, February 25th, 1889

THEODORE MOSS, ESQ., Secretary of the Board of Electrical Control,
1218 Broadway, New York:

DEAR SIR:—This Company acknowledges the receipt on the 20th inst. of your communication to its President, dated February 18th. In reply to the request contained therein, we beg to say that we received the notice of November 16th, 1888.

As your Board is aware, this Company has claimed that the existing subways are insufficient and impracticable for use for its electrical conductors, and wholly without means of distributing the electrical currents necessary for its business, and this view is still respectfully insisted upon.

This Company has, however, as you are also aware, by letter of Butler, Stillman & Hubbard, its Counsel, dated January 17th, 1889, to his Honor the Mayor, offered at its own expense to make a test for the purpose of determining the practicability of the present subways for its use.

This letter was submitted to your Board by the Mayor, and on January 18th a resolution was thereupon passed allowing such test to be made, and directing the Expert of the Board to place himself in communication with this Company on the subject.

This Company at once took in hand the matter of obtaining the requisite cable, for making the test in Broadway between 23d and 34th streets, Sixth avenue between 23d and 34th streets, and 23d street between Fifth and Sixth avenues, making in all about 7,000 feet, conferred with the Expert of your Board, and have had numerous interviews with him, and have been in communication with leading cable manufacturers, and has contracted for necessary cable as above, and are pushing forward the test, in good faith, as rapidly as possible, so that the same may be completed at the earliest possible moment.

The exact length of time necessary to complete the test it is absolutely impossible for us to state; but at the last meeting of your Board it was understood that it would require forty-five days for the delivery of the necessary cable and the placing of the same in the subway, ready for testing.

Presuming that the above will satisfactorily answer your enquiries, we remain,

Very respectfully yours,

EUGENE T. LYNCH, Pres.

Mayor Grant offered the following resolution:

Resolved, That the Secretary write a letter to the United States Illuminating Company, stating that, unless the test now being made by that Company shall be completed and its poles and wires removed from the surface of the streets and avenues where subways have been provided within forty-five (45) days from the 18th day of February, 1889, the Board will request the Mayor to take summary action in the premises, according to law.

Unanimously adopted.

The following communication was read:

NEW YORK, 25th of February, 1889.

To the Honorable Board of Electrical Control.

GENTLEMEN:—In reply to your inquiry we beg to say that we have only four wires for a short section paralleling any conduit, to wit, from 18th street to 33d street on Sixth avenue, and that we have nearly completed our arrangements to go underground there.

In fact we have ordered four cables from as many different manufacturers, each having a different method of insulation and protection, that the effects of the different illuminating and sewer gases and the acids and alkalis in the earth may be noted on the different insulations.

Weather permitting, we would require but a short time to place our few wires underground.

Yours respectfully,

EAST RIVER ELECTRIC LIGHT CO.,

JOHN J. MOORE, Manager.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to acknowledge the receipt of the communication of the East River Electric Light Company referring to the placing of its wires on Sixth avenue in the subways, and to say that the Board will request the Mayor to take summary action in the premises, according to law, unless the said wires are removed from the surface of the streets within forty-five (45) days from the 18th day of February, 1889.

The following communications were read:

THE HARLEM LIGHTING COMPANY,

242 & 244 EAST 122D STREET,

NEW YORK, February 22d, 1889.

HON. THEODORE MOSS, Secretary of Board of Electrical Control, City:

DEAR SIR:—In acknowledging your communication of the 18th inst., regarding notice addressed to this Company on the 16th day of November last, I beg to state that this Company has placed its wires underground as directed in 125th street, between Third and Lexington and Lexington and Fourth avenues, and has removed the poles and wires which were formerly used by it before the subway facilities were availed of, as follows:

- 2 poles and 2 wires on 105th street and Third avenue.
- 1 pole and 2 wires on 125 East 125th street.
- 1 pole and 2 wires on 137 E. 125th street.
- 1 pole and 2 wires on 167 E. 125th street.
- 1 pole and 2 wires on 175 E. 125th street.

[FEBRUARY 25, 1889.]

This Company has no poles or wires on any other street or avenue in the City of New York in which subway facilities have been provided.

Yours respectfully,

E. A. LESLIE, Act. General Manager.

THE MANHATTAN ELECTRIC LIGHT COMPANY (LIMITED),

OFFICE, 511 BROADWAY,

NEW YORK, February 23, 1889.

HON. THEODORE MOSS, Secretary Board of Electrical Control, City:

DEAR SIR:—Replying to your communication of the 18th inst., regarding notice addressed to this company, I beg to say that we have placed in the Sixth avenue and Broadway conduits up to this time about 31,000 feet of cable, and that we are still engaged in drawing in an additional 19,000 feet, which we wish to have ready for operation within a few weeks, provided we are permitted to complete the electric light line on First avenue and to make the necessary temporary overhead connections between First avenue and Broadway at 14th and 28th streets, to do which permission was recently requested. If permitted to make these temporary overhead connections, we shall undoubtedly be able to take down all our wires on Broadway and Sixth avenue and other streets in the subway district within forty-five days.

Yours respectfully,

E. A. LESLIE, General Manager.

POSTAL TELEGRAPH-CABLE COMPANY,

WASHINGTON BUILDING, No. 1 BROADWAY,

NEW YORK, February 21st, 1889.

THEODORE MOSS, ESQ., Sec'y Board of Electrical Control, 1218 Broadway, New York:

DEAR SIR:—Your letter of 18th instant is received. In reply thereto I have to report that none of your lines in this City are situated on the streets which have been provided with subways for electrical conductors. Nearly all our lines in this City being comprised in an East side and a West side through line in connection with the Fire Alarm Department, with the exception of those upon housetop fixtures, over which our few branch offices are reached. Yours respectfully,

A. B. CHANDLER, President.

THE BRUSH ELECTRIC ILLUMINATING COMPANY,

204-210 ELIZABETH STREET,

NEW YORK, February 21st, 1889.

The Board of Electrical Control, 1218 Broadway, City:

GENTLEMEN:—Replying to your favor of the 18th instant, in which you state that on the 16th day of Nov., 1888, a notice was addressed to our Company requesting us to place our electrical conductors underground in the streets and avenues where sub-

ways have been provided, and to remove our poles and wires from said streets and avenues within ninety days; we acknowledge the receipt of this notice and have done all in our power to carry out the request of the Board.

On June 15th, 1888, we ordered from the Standard Underground Cable Company one mile of eight-conductor cable. This cable was delivered early in Sept. of '88, and drawn into one of the ducts of the subway from 14th to 35th streets; we had connections made with the manholes at each of these terminals, and the cable drawn up to connect with wires on poles. The first time that the cable was tested it was found to be defective in insulation in some of the joints. The Standard Underground people requested time to cut out the defective places and replace them, and up to the present time the cable has not been handed over to us as perfect. We delayed ordering any other cable for use in the subway until the one in question was proven a success or a failure.

Just how soon this cable will be ready to use the writer cannot say, but enclosed please find copy of letter received to-day from the General Manager of the Standard Underground Cable Co., which explains itself.

This Company are ready and willing to do all in its power to place its wires in the conduits, and should this cable fail to perform the duty required of it we will immediately order wire made up in a different way and try again.

Trusting this will answer your question, we have the honor to be,

Yours very truly,

BRUSH ELECTRIC ILLUMINATING CO.,

W. H. M'GRATH, Supt.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to write a letter to the Brush Electric Illuminating Company, acknowledging the receipt of its communication referring to the placing of electrical conductors underground in the streets and avenues where subways have been provided, and stating that the Board will request the Mayor to take summary action in the premises, according to law, unless all of its poles and wires are removed from the surface of the streets and avenues, as above, within forty-five (45) days from the 18th day of February, 1889.

Unanimously adopted.

The following communication was read:

AMERICAN DISTRICT TELEGRAPH COMPANY,
EXECUTIVE OFFICES, 8 DEY STREET,
NEW YORK, February 22d, 1889.

THEODORE MOSS, Esq., Sec'y Board of Electrical Control, No. 23 West 23d St., New York:

DEAR SIR:—I am in receipt of your circular letter of the 18th inst., addressed to the President of this Company, referring to previous circular of November 19th, 1888.

requesting that the electrical conductors of this Company be placed underground in streets and avenues where subways have been provided, as per the list named in that letter. In reply thereto I desire respectfully to call your attention to the letter of date September 15th, 1885, addressed to the Secretary of the Board of Electrical Control, by the Supt. of this Company—copy enclosed—in which the character of the lines of the A. D. T. Co. is fully set forth.

We have no poles on any of the routes named, and our wires run in a manner not to be visible from the street except where a crossing of the street is made above the buildings, and it is not believed to be practicable to maintain these wires in conduits, even had they been prepared with a view to such occupancy; therefore I cannot state that this Company has done anything toward the placing of its electrical conductors underground.

It is the desire of this Company to meet, as far as is found practicable, the views of the Board of Electrical Control regarding the operation of the law governing its wires, but up to this time it has been our belief that this system of underground conductors would not be disturbed until those systems which maintain trunk or pole lines shall first have been gotten out of the way; that done, I am confident there will be found but very little cause for disturbing systems which maintain only short spans of wire across the streets, but are required to be so run as to be connected into every building on either side of the streets.

The cost of doing this would be ruinous to the business of the Company, even if the practicability should be demonstrated.

Very respectfully,

CHARLES A. TINKER, Vice-President.

NEW YORK, Sept. 15th, 1885.

THEO. MOSS, ESQ., Secretary, Commissioners of Electrical Subways, No. 23 West 23d Street, N. Y. City:

DEAR SIR:—Replying to your esteemed request of the 4th inst., I beg to submit a map of one of our "District" offices showing the manner of running our wires, giving the location and course of each circuit, and also beg to submit another map, comprising the whole city, showing the location of our several District offices, where wires are run in a similar manner, our offices are indicated by a red ink dot. Also attached is a printed list showing location of same.

Inasmuch as each "District" is separate and purely local and complete in itself, I take it that a large map of one "District" with its several circuits and a description of our system will fully comply with your requirements.

The American District Telegraph Company's system covers most of the residences and places of business through the central part of the City from the Battery to 135th street, at various points and in some "Districts" in the most thickly settled portions of the City our wires run to the North and East Rivers from our "District" offices in the vicinity (dotted in red on map B).

We have no poles or incumbrances on the streets, as our wires are run under the eaves in the rear of buildings, and are not visible from the street except where they cross to connect two or more blocks.

We could not establish a system of pole lines because of the frequency of connections for subscribers, but where it is necessary to conduct several wires together, for any distance, small wooden structures are erected, fastened to the roofs or rear walls of buildings. Each circuit of a single wire permits us to connect 100 call boxes for as many different subscribers, for which no rent is charged, and there are many thousands of these messenger call boxes connected and the demand is ever increasing and many orders are received and executed daily, without, however, any new wires.

Permission to affix our wires to houses, etc., is freely accorded us by subscribers and applicants for our call boxes and the least objectionable and most simple method is adopted to connect them.

In the case of the American District Telegraph Company, it is clearly evident that the placing of wires underground would be utterly impracticable and would annihilate its business, as it would necessitate the excavating of almost every street and avenue and also the construction of conduits or branches from the main line on each side of the street or avenue to connect each subscriber's residence or place of business and the constantly increasing demand for boxes and the therefore necessary extension of the system would make it imperative upon the Company to construct new conduits or branches daily.

In connection with such an existing state of affairs it might be said that the conduits or branches from the main line could be laid on the same principle as Gas or Water pipes, so as to connect each house or building with the main, irrespective of the fact that many residents, etc., may not subscribe for the service of this Company.

Such a plan would not be feasible, as the undertaking thereof would completely demoralize the roadways for many years to come, and there can never be a time when all classes of people would use Messenger service in common with the consumption of water and gas.

As the wires are placed at present the connection of new houses or buildings is but a trifling matter, but with the labor and expense consequent to an underground system a District Telegraph Company could not exist for a moment, and the people of New York City and thousands of strangers would be barred from the use of an established and imperative necessity.

Yours respectfully,

G. V. W. FROST,

Superintendent American District Telegraph Co.

Mayor Grant offered the following resolution:

Resolved, That the Secretary be directed to write a letter to the American District Telegraph Company, acknowledging the receipt of its communication addressed to the Board, relating to the placing of its conductors underground, and stating that, in the opinion of the Board of Electrical Control, there is no reason why its electrical conductors should not be placed in the subways, as well as those of other companies.

Unanimously adopted.

Commissioner Moss stated that the Board had not received any communication from the Western Union Telegraph Company answering the Board's communication relating to its placing its electrical conductors underground.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be authorized and directed to communicate with the Western Union Telegraph Company, stating that, unless said Company removes its poles and wires from the streets and avenues where subways have been provided according to a notice sent to the Company from this Board, within twenty days from the receipt of this letter, the Board will request the Mayor to take action through the Department of Public Works for the removal of the same.

Unanimously adopted. (Amended).

Mayor Grant offered as an amendment to the last resolution, moved by Commissioner Gibbens, the following resolution:

Resolved, That the Secretary be authorized and directed to communicate with both the Western Union Telegraph Company and the Metropolitan Telephone and Telegraph Company, stating to each Company that, unless it removes its poles and wires from the streets and avenues where subways have been provided, according to a notice sent to it from this Board, within thirty days from the receipt of this letter, the Board will request the Mayor to take action through the Department of Public Works for the removal of the same.

Unanimously adopted.

The following application of the Manhattan Electric Light Company, Report thereon, and communication in respect thereto, were read:

NEW YORK, February 19th, 1889.

Permission is hereby requested by the Manhattan Electric Light Company, Limited, to complete electric light line on First avenue, now under construction, twenty-two poles yet to be erected between 42d and 59th streets. Original permit revoked. "Urgent."

Line is intended to connect Electric Station, 80th street and Avenue B, with subways on Broadway and Sixth avenue.

Subject to the Rules and Regulations of the Board of Electrical Control which are hereby agreed to by

THE MANHATTAN ELECTRIC LIGHT CO., LIMITED,

E. A. LESLIE, Genl Mgr.

To the Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN:—On the annexed application of the Manhattan Electric Light Company, Limited, dated February 19th, 1889, we have the honor to report as follows:

This is part of a new and substantial line being rebuilt on this avenue from Houston street to the Harlem River, under the Rules of the Board, which is rendered useless by this break. The line, if completed, will accommodate many wires and help to clear other streets of wires which can be run over this route. There is no sub-

way in this street. The work on this line was stopped on account of interference with Fire Department wires. This trouble has now been remedied, the Fire Department lines having been reconstructed on the other side of the street by the companies who built the new line.

H. S. KEARNY, Engineer.

S. S. WHEELER, Elec. Expert.

NEW YORK, February 19, 1889.

His Honor HUGH J. GRANT, President of Board of Electrical Control, Mayor's Office, City:

SIR:—The Manhattan Electric Light Company (Limited) has, since its inception, desired to operate exclusively underground, and in proof of that assertion, I beg to call your attention to a copy of a letter annexed hereto (Exhibit A.), addressed to your Construction Company, the Consolidated Telegraph & Electrical Subway Company, under date of September 26th, 1888, asking for subway facilities covering a large section of the city; also to their reply thereto (Exhibit B), in which it is stated that, outside of the limited territory generally known as the "Subway District," viz.: on Broadway, from 14th to 58th streets, and on Sixth avenue, from 18th to 58th streets, with one unimportant exception, they are unable to accommodate us.

Soon after the receipt of the Construction Company's reply, we made application on their regular forms for facilities in such subways as we could utilize, viz.: On Sixth avenue, from 18th to 58th streets; on Broadway, from 14th to 58th streets, both sides between 14th and 34th streets; on 23d street, from Broadway to Sixth avenue; on 25th street, from Broadway to Sixth avenue, and up to the present time have drawn therein upwards of 30,000 feet of cable, and are now busily engaged in drawing in an additional 20,000 feet, all of which will be in readiness for operation within two or three weeks.

Our electric light station is located on 80th street and East River, and, in order to reach and operate the cables in the above mentioned subways, and because underground facilities could not be provided for an indefinite period, as per letter of the Subway Company (hereto attached) previously referred to, we applied to the Board of Electrical Control for permission to construct a temporary overhead line on First avenue, and also for permission to string temporarily a number of wires from First avenue to Broadway on two existing pole lines, and distinctly expressed our willingness, and agreed to take down said line and wires as soon as subways were provided by your Honorable Board. The permit to construct the First avenue line was duly granted and upon receipt, January 29, 1889, construction was begun, and up to your Board meeting of yesterday we had nearly completed the pole line and strung a number of wires thereon. There remain to be erected only twenty-two poles between 42d and 59th streets on First avenue, but as this gap is practically in the middle of the line, no use whatsoever can be made of the poles and wires already up, and we are thus effectively prevented from connecting with and operating our underground cables.

The application for a permit to string wires temporarily across town on existing pole lines, from the First avenue line to the Subway manholes, still rests in your hands unacted upon. In view of the granting of the First avenue permit, which we assumed, as a matter of course, to mean that the work might not only be begun, but also completed, and also in view of the oral assurances of the Board, frequently com-

municated, that we should be enabled to reach the Subways; and, further, relying upon the good faith of your Board and acting in good faith ourselves, we respectfully ask that our application to recommence and go on with the work of connecting our Station with the Subways shall receive your prompt and favorable consideration.

Your resolution of yesterday revoking all permits places us in an exceedingly embarrassing position in two instances, for which we beg your special lenience, viz.:

Proctor & Turner's new Theatre on 23d street, between 6th and 7th avenues, and the new Union Square Theatre on 14th street and 4th avenue. Both of these theatres are dependent on us for light, and both will open at an early date; the former on Tuesday, the 26th instant, and the latter on the 28th instant. Under a permit granted some time since we were authorized to string the necessary wires to reach these places, and, having no reason to anticipate your action of yesterday, contracted to furnish them with electric light. Should we be compelled to disappoint them, serious and irreparable damage might ensue. We have, therefore, made special applications in these two cases, hoping that their urgency and importance may secure your favorable action.

As further evidence of our good faith, we beg to add that not only have we put cables in the conduits already constructed, but we are urging the development and extension of the subway territory.

In conclusion, we desire to inform you of the fact that the Manhattan and Harlem Electric Light Companies' managements are identical; that the Harlem Lighting Company occupied the conduits in 125th street, which is the only place where its wires are over conduits, within four weeks after their completion; and that it is now operating through the conduits all of its arc light in this street, city and commercial; hence the credit of having established the first high-tension electric light circuit underground in this city and the removal of poles and overhead wires belongs to this Company.

We have the honor to be, Dear Sir,

Very respectfully yours,

THE MANHATTAN ELECTRIC LIGHT COMPANY (LIMITED),

ABRAM BERNHEIM, Vice-President.

EXHIBIT A.

NEW YORK, September 26, 1888.

To the Consolidated Electrical Telegraph & Subway Company, No. 18 Cortlandt St., City:

GENTLEMEN:—We forward to you herewith three applications for spaces in your Subways on Sixth avenue, between 18th and 58th streets; on 25th street, between Sixth avenue and Broadway, and on Broadway, between 14th and 59th streets, respectively. In addition thereto, we desire subway facilities for the following streets exclusive of those already named in the applications submitted, viz.:

On 14th street, from Union Square to Third avenue, thence down the Bowery to Grand street.

Broadway, from 14th street to Grand street.

25th street, from Sixth avenue to Seventh avenue.

Seventh avenue, from 25th street to 23d street.

23d street, from Eighth avenue to First avenue.

Eighth avenue, from 14th street to 58th street.
Second avenue, from 14th street to 125th street.
Third avenue, from 14th street to 125th street.
First avenue, from 14th street to 125th street.
80th street, from Avenue B to Third avenue.
14th street, from Eighth avenue to First avenue.

Please advise us how soon it will be possible to provide us with the above accommodations, and very much oblige.

Yours respectfully,

THE MANHATTAN ELECTRIC LIGHT COMPANY (LIMITED).

EXHIBIT B.

EXECUTIVE OFFICES OF

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,

No. 18 CORTLANDT STREET,

NEW YORK, September 29th, 1888.

Manhattan Electric Light Co., Harlem Lighting Co., No. 507 Broadway, N. Y. City:

GENTLEMEN:—I beg to acknowledge receipt of your favor of the 26th inst., enclosing applications for space in subways on Sixth avenue, Twenty-fifth street and Broadway, respectively.

On all the other streets and avenues mentioned in your letter, with the exception of Twenty-third street, between 4th and 6th avenues, no electric subways have as yet been constructed. Owing to the lateness of the season and the absence of authority from the Board of Electrical Control, it is impossible for us at this time to say when they can be provided. We will however, keep you promptly advised as to our progress.

Very truly yours,

E. A. LESLIE, Gen'l M'gr.

The following resolution was offered:

Resolved, That the application of the Manhattan Electric Light Company (Limited), dated February 19, 1889, to complete the construction of the electric light line on First avenue, be granted; however, with the understanding and on the condition that the Company allow no other company to string its wires on the poles to be erected, unless upon the express permission of the Board of Electrical Control, given to such other company so to do in consideration of its taking down other poles belonging to it.

Unanimously adopted.

The following application and report of the Engineer and Expert on the same were read:

NEW YORK, February 12th, 1889.

In order to connect with subways on Sixth avenue and Broadway, permission is hereby requested by the Manhattan Electric Light Company, Limited, to string temporarily ten (10) wires on existing pole line on Twenty-fifth street, from First to Third avenue; on Third avenue to Twenty-eighth street; on Twenty-eighth street to Subway Manhole on west side of Broadway; resetting four poles on 25th street and four poles on Third avenue and 28th street.

Also on Fourteenth street, from First avenue to Subway Manhole on west side of Union Square; replacing fifteen poles with twelve poles between First and Third avenues. Owners of poles have given consent.

Subject to the Rules and Regulations of the Board of Electrical Control, which are hereby agreed to by

THE MANHATTAN ELECTRIC LIGHT CO., LIMITED,

By E. A. LESLIE, Gen'l M'g'r.

To the Board of Electrical Control.

NEW YORK, February 25th, 1889.

To the Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN:—We respectfully report on the annexed application of the Manhattan Electric Light Company, dated February 12th, 1889, as follows:

These wires are to connect the cables laid in the subways by applicant, together with two large theatres, for which they have received contracts for lighting, to their station on the east side of the city.

Applicant intends to abandon its station on west side of town, which will enable it to abandon the 14 wires running west to the Station in 25th street.

It seems to be necessary to grant permission for the running of some wires to connect the cable in subway on Broadway with the electric light Station on and near First avenue, until subways are built.

The wires through 14th street can be strung on existing Brush poles, without increasing the number of poles existing.

The wires for the connections of the upper end of the subway on Broadway can be carried through 28th street on Brush poles, as suggested, without increasing the number of existing poles. This line is badly constructed in the neighborhood of Third avenue. The pole corner of Third avenue is weak, irregular, overloaded and leans into the street. The wires under the elevated station are also in bad condition. Or the same wires could also be carried on the line of poles running through 27th street. This line is weak and irregular. The wires could also be run on the United States poles, which run through 30th street.

The number of wires asked for seems excessive, and can be cut down to eight on each street.

H. S. KEARNY, Engineer.

S. S. WHEELER, Elec. Expert.

Mayor Grant offered the following resolution:

Resolved, That the application of the Manhattan Electric Light Company, Limited, dated February 12, 1889, to string temporarily ten wires on existing poles on 25th street, from First to Third avenues, and on the other streets therein mentioned, and to do the other acts therein indicated, be granted; with this modification, however, that the permission extend to the stringing of only eight wires, instead of ten wires.

Unanimously adopted.

The following communication from Expert Wheeler was read:

NEW YORK, February 25th, 1889.

The Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN:—In connection with a large number of applications for permission to string electrical conductors overhead, which have been referred to me, I beg respectfully to call your attention to the following facts:

A great many of the streets of this city are unnecessarily disfigured and encumbered by the presence in them of two and three, and sometimes four, distinct and separate lines of poles for wires of the same class. The sole reason for the maintenance of so many sets of poles is the preference of their owners, not to share their use with others, but to maintain independently the sole use and ownership of all the poles upon which their wires are run, and thereby control the right of way to the exclusion of others. Besides doubling the number of poles in the city, this arrangement is objectionable for other reasons—it gives rise to faulty construction in several ways. It is necessary that one set of poles should pass through and close to the wires strung on the other lines of poles.

Again many of the streets are occupied by poles used for carrying a number of wires from one quarter of the city to another. In all such cases the several companies have almost invariably chosen different streets instead of uniting and going through one street with one line of poles carrying all their wires.

A case of this kind is brought up by the application of the Manhattan Company for permission to connect the Broadway subway with the wires on First avenue. The wires of the Brush Company are brought through 28th street to Broadway from Third avenue, while the wires of the U. S. Company reach the same point by connecting through 30th street. The Brush Company also have wires connecting through 27th street, from Third avenue to Broadway.

Undoubtedly a reduction of 40 per cent. in the total number of poles could be made at once, without interference with business, by properly combining existing wires on single lines of poles, and by carrying all through connections going in a common direction in one street instead of allowing each wire owner to occupy a separate street.

Very respectfully,

SCHUYLER S. WHEELER, Electrical Expert,

Board of Electrical Control.

Mayor Grant offered the following resolution:

Resolved, That the communication of Expert Wheeler be spread on the minutes, that its recommendations be adopted as the sense of the Board, and that in future recommendations of the Expert touching matters of like nature the theory expressed therein be followed.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the Engineer of this Board bring in a recommendation for a sub-way on 28th, 29th, or 30th street, immediately.

Unanimously adopted.

The following Application and Report thereon were read:

NEW YORK, January 14th, 1889.

Permission is hereby requested by C. A. Blanchard and Company to erect two electric lampposts on the west side of 36th street, about one hundred and fifty (150) feet west of Broadway, in front of the Hotel Marlborough.

We agree to keep lights lit all night if permit is granted.

Subject to the Rules and Regulations of the Board of Electrical Control, which are hereby agreed to by
C. A. BLANCHARD & CO.,

Hotel Marlborough, New York.

To the Board of Electrical Control.

NEW YORK, February 21st, 1889.

To the Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN:—We have the honor to report on the annexed application of C. A. Blanchard & Co., dated January 14th, 1889, referred to us at the last meeting, as follows:

It has always been customary to grant the privilege to erect lampposts in front of hotels; and these posts can be connected with the present overhead circuit without adding one foot of overhead wire, by leading the wire into the vault through one of the posts.

H. S. KEARNY, Engineer.

S. S. WHEELER, Elec. Expert.

Mayor Grant offered the following resolution:

Resolved, That the Application of C. A. Blanchard & Co. to erect two lampposts in front of the Hotel Marlborough be granted; on condition, however, that the con-

nections to them be made from the Hotel, from underneath, and that the lamps be kept lighted all night.

Unanimously adopted.

The following Application and Report thereon were read:

UNITED STATES ILLUMINATING CO.,
59 & 61 LIBERTY STREET,
NEW YORK, February 11th, 1889.

THEODORE MOSS, Esq., Secretary Board of Electrical Control:

SIR:—The United States Illuminating Company has received orders from the Commissioner of Public Works to place five additional lamps at and around the New West Washington Market.

Permission is requested to place wooden lampposts for the above work as follows:

- 1 on Ganzevoort street, opposite Lawton avenue.
- 1 on Bloomfield street, opposite Lawton avenue.
- 1 on s. e. corner 13th avenue and Bloomfield street.
- 1 on n. e. corner 13th avenue and Ganzevoort street.
- 1 on 13th avenue, opposite Hewitt avenue.

Please send duplicate to file at Board of Public Works.

Respectfully yours,

A. E. SCOULLAD, Supt.

NEW YORK, February 25th, 1889.

To the Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN:—We respectfully report on the annexed application of the United States Illuminating Company, dated February 11th, 1889, as follows:

The wires of this Company already reach this point, and they have an order from the Department of Public Works to light the Market.

There are no subways in this district.

H. S. KEARNY, Engineer.

S. S. WHEELER, Elec. Expert.

Mayor Grant offered the following resolution:

Resolved, That the Application of the United States Illuminating Company, dated February 11th, 1889, to place, at the request of the Commissioner of Public Works, five wooden lampposts at and around the New West Washington Market, at the points therein specified, be granted.

Unanimously adopted.

Engineer Kearny and Expert Wheeler made the following report on the application of the Brush Electric Illuminating Company, dated January 16, 1889, to connect electric lamp with its circuit at 1177 Broadway:

"The applicant has wires in front of premises, and has contract with tenant for commercial lighting. But there is a subway through this street for this class of conductors."

Mayor Grant offered the following resolution:

Resolved, That the application of the Brush Electric Illuminating Company, dated January 16, 1889, to connect electric lamp with circuit at 1177 Broadway, be denied.

Unanimously adopted.

The Engineer and Expert made a report on the application of the Western Union Telegraph company, dated February 14, 1889.

"To run two wires on existing poles from 9th avenue and 21st street, through 21st, to 10th avenue; thence on 10th avenue to 23d street; and thence on housetops to 510 West 23d street; also to run two wires on existing poles in 46th street, from 3d avenue to 5th avenue; and thence to 47th street and 5th avenue, on housetops," as follows:

"There is a line of poles in 46th street over the required route, and the crossing to 47th street at 5th avenue can be made easily over housetops.

"Part of the line of poles in 46th street, however, are in very shabby condition, particularly one pole at the corner of Madison avenue, which is very heavy and clumsy in appearance and leans over into street about five feet. The neighborhood is occupied by handsome property and the inferior and unsightly parts of the line should be rebuilt.

"Over the 21st street route there is a good line of poles in good condition. The poles on 10th avenue are also good, and altogether form a satisfactory route for the wire asked for.

"There are no subways in any of the streets in question."

Mayor Grant offered the following resolution:

Resolved, That the application of the Western Union Telegraph Company, dated February 14, 1889, to run two wires in streets and in manner therein indicated, be denied.

Unanimously adopted.

Engineer Kearny and Expert Wheeler made a report on the application of the Western Union Telegraph Company, dated February 9, 1889.

"To string one wire on poles now standing in 32d street, from the southwest corner of 6th avenue and 32d street, three poles," as follows:

"This is to connect with Ryerson & Brown's stable. There is no subway in this street. The poles mentioned carry two electric light wires, and, therefore, putting signalling wires on these poles would violate Rule X; but as there are no other poles in this street this rule might be suspended in this case. The line is to connect with line on Sixth avenue, where there is a subway, and such connection should be made to line in this subway."

Mayor Grant offered the following resolution:

Resolved, That the application of the Western Union Telegraph Company, dated February 9th, 1889, to string one wire on poles now standing in 32d street, from the southwest corner of 6th avenue and 32d street, be denied.

Unanimously adopted.

The Engineer and Expert made a report on the application of the North New York Lighting Company, dated February 12, 1889,

"To string four wires on our existing pole line on 3d avenue, from Iron Bridge at Harlem River to 164th street,"

as follows:

"This applicant states that it has signed contracts for 400 incandescent lights with customers along this route, which customers can only be reached by running new wires on existing poles, for which permission is asked.

"There is no probability of subways being constructed in this locality for some time."

Mayor Grant offered the following resolution:

Resolved, That the application of the North New York Lighting Company, dated February 12, 1889, to string four wires on its existing pole line on Third avenue, from Iron Bridge at Harlem River to 164th street, be denied.

Unanimously adopted.

The Engineer and Expert made a report on the application of the Gold and Stock Telegraph Company, dated February 18, 1889,

"To repair one wire used for the transmission of Time signals, on housetops, in Broadway, between 23d and 40th streets,"

as follows:

"There is a subway in this street for this class of conductors."

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Gold and Stock Telegraph Company, dated February 18, 1889, be referred back to that Company, with a notification to go in the subway immediately.

Unanimously adopted.

The Engineer and Expert made a report on the application of the Gold and Stock Telegraph Company, dated January 4, 1889,

"To remove an aerial cable from the housetops at the corner of Broad and Wall streets to the poles in Broad street, from Wall street to No. 16 Broad street, and thence to the roof of No 16 Broad street,"

as follows:

"The Board has a subway in this district for all this class of conductors, and the Company's conductors have been ordered underground. This application seems to come under that order."

Mayor Grant offered the following resolution:

Resolved, That the application of the Gold and Stock Telegraph Company, dated January 4, 1889, to remove an aerial cable as therein specified, be denied.

Unanimously adopted.

The Engineer and Expert made a report on the application of the Harlem Lighting Company, dated February 23d, 1889,

"To take down 127 poles on Third avenue, between 86th and 130th street, and transfer wires thereon to another pole line already constructed in the same territory," as follows:

"This is an application to transfer wires from old and unsafe poles to a new line of poles on same side of street erected under a permit of the Board for this purpose, and should be granted."

Mayor Grant offered the following resolution:

Resolved, That the application of the Harlem Lighting Company, dated February 23d, 1889, to take down 127 poles on Third avenue, between 86th and 130th streets; and transfer wires thereon to another pole line already constructed in the same territory, be granted.

Unanimously adopted.

The Engineer and Expert made a report on the application of the Western Union Telegraph Company, dated February 4th, 1889,

"To move one pole about 30 feet north of its present position on Lexington avenue and 41st street, for the purpose of accommodating Messrs. Pottier & Stymus, owners of the factory at that point,"

as follows:

"This pole is in front of doorway of new building, and if allowed to be moved as desired will cease to be an obstruction. The construction of the line is good. There is no subway in this street."

Commissioner Moss offered the following resolution:

Resolved, That the application of the Western Union Telegraph Company, dated February 4, 1889, to move one pole about 30 feet north of its present position on Lexington avenue and 41st street, be granted.

Unanimously adopted.

The Engineer and Expert made a report on the application of the Western Union Telegraph Company, dated February 13, 1889,

"To run 4 wires from Elevated Railroad at 6th avenue and 35th street to 1323 Broadway";

and on application of said Company, dated February 13, 1889,

"To run 4 wires from corner 30th street and Broadway to Grand Hotel on housetops";

and on application of said Company, dated February 16, 1889,

"To run wires to Western Union offices" as therein specified;

and on application of said Company, dated February 12, 1889,

"To renew 4 wires now on existing poles in 41st street, from the corner of 6th avenue and 41st street to Broadway";

as follows:

"Application, dated February 13, 1889, to run 4 wires from Elevated Railway Structure, 6th avenue and 35th street, across the open space or Park, to 1323 Broadway. This point can be reached through the subway from the intersection of Broadway and Sixth avenue, and it seems a better route.

"Application, dated February 13, 1889, to run 4 wires from the corner of 30th street and Broadway to Grand Hotel, corner of 31st street, on housetops. Should be put in subways which have been provided along the route.

"Application, dated February 16, 1889, to run wires from Western Union offices to various hotels on Broadway, between 20th and 42d streets. Should all go in subway which has been provided along this route.

"Application, dated February 12, 1889, to renew 4 wires now on existing poles in 41st street, from 6th avenue to Broadway. Why not run the same number of wires in subway in 42d street and take down line of poles in 41st street, between 6th avenue and Broadway?"

Mayor Grant offered the following resolution:

Resolved, That the applications of the Western Union Telegraph Company, dated respectively February 12, 13, 13 and 16, 1889, to do the acts therein respectively specified, be denied.

Unanimously adopted.

The Engineer and Expert made a report on the application of the Brush Electric Illuminating Company, dated January 26, 1889, to connect motor with its circuit at 853 Broadway, as follows:

"This applicant has wires in front of building and a contract for furnishing electric power. There is no subway in this street for this class of conductors at present."

Mayor Grant offered the following resolution:

Resolved, That the application of the Brush Electric Illuminating Company, dated January 26, 1889, to connect motor with its circuit at 853 Broadway, be denied.

Unanimously adopted.

The Engineer and Expert made a report on the application of the United States Illuminating Company, dated February 19, 1889, to connect lamps with circuit at No. 1 Bowery, and on its application, dated February 20, 1889, to attach lamps to circuits at 330 Church street, 427 Washington street, 405 Grand street, 132 Park Row, 1287 Third avenue, 237 Grand street and 158 Bowery, as follows:

"The wires of the Company run in front of the premises in all of these cases, except at 330 Church street, where they pass at the corner within fifty feet of the premises. The connections asked for can, therefore, be made without adding to the existing wires overhead. The Company have contracts for lighting at all of these places; and there are no subways in these streets."

Mayor Grant offered the following resolution:

Resolved, That the applications of the United States Illuminating Company, dated respectively February 19 and 20, 1889, to connect lamps with its circuits at places therein respectively indicated, be laid over.

Unanimously adopted.

The Engineer and Expert made a report on the application of the Western Union Telegraph Company, dated January 31, 1889, to set six poles in St. Nicholas avenue, between 130th and 140th streets, to replace poles that are rotten and dangerous, as follows:

"There is a line of small weak poles on the east side of the avenue, carrying 19 wires, and in bad order, belonging to the French Cable Company. There is a line of large poles on the west side of avenue, carrying ten wires, which could accommodate all the wire of the other line. The useful wires on the east side should be placed on the better pole line, and the inferior line of poles on the east side should be removed."

Mayor Grant offered the following resolution:

Resolved, That the application of the Western Union Telegraph Company, dated January 31, 1889, to set six poles in St. Nicholas avenue, between 130th and 140th streets, to replace poles that are rotten and dangerous, be denied; and that it be

suggested to the Company to carry out the recommendation of the report of the Engineer and Expert thereon.

Unanimously adopted.

The Engineer and Expert reported on the application of the Brush Electric Illuminating Company, dated February 20, 1889, to connect electric lamps with its circuits, at Hotel Plaza, 5th avenue and 59th street; Proctor & Turner's, 23d Street Theatre, west of Sixth avenue; Ludwig Baumann & Company, 508 Eighth avenue; Hymes & Cohn, 611 Broadway, as follows:

"The applicant has wires near premises and contracts with tenants for commercial lighting. There is no subway in these streets for this class of conductor."

Mayor Grant offered the following resolution:

Resolved, That the application of the Brush Electric Illuminating Company, dated February 20, 1889, to connect electric lamps with its circuits at the places therein mentioned, be denied.

Unanimously adopted.

The Engineer and Expert reported on the application of the Mount Morris Electric Light Company, dated February 6, 1889:

"To erect forty-five ft. poles and string wires upon the same from Tenth avenue to Sixth avenue, on 38th street. In order to reach the subways on Sixth avenue and Broadway from its Station on Vandam and Greenwich streets. The Ball Electric Illuminating Company have already been granted a permit upon this street, but have neglected to act upon it much to our injury," as follows:

"This application for a new pole line in 38th street is debarred by the Board's resolution of February 18th."

Mayor Grant offered the following resolution:

Resolved, That the application of the Mount Morris Electric Light Company, dated February 6, 1889, to erect forty-five ft. poles and string wires upon the same from Tenth avenue to Sixth avenue on 38th street, be denied.

Unanimously adopted.

The Engineer and Expert reported on the application of the Manhattan Electric Light Company, Limited, dated February 19, 1889:

"To connect existing lines on Broadway, Bowery and Grand street with 342 Broadway, Southern Pacific Railway; 409 Broadway, Murray, Le Bar & Kennard; 428 Broadway, Belknap, Johnson & Powell; 713 Broadway, Philipp Mansch; 788 Broadway, Louis Fleischmann; 259 Bowery, M. F. Lyons; 326 Grand street, Wm. McBride;" as follows:

"This is an application to make lamp connections at seven places. These are in streets where there are no subways. The lines of the Company run in front of each building, and the Company has contracts signed for supplying light in each case."

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Manhattan Electric Light Company, Limited, dated February 19, 1889, to make lamp connections with various premises therein mentioned, be laid over.

Unanimously adopted.

Engineer Kearny and Expert Wheeler reported on the application of the Manhattan Electric Light Company, Limited, dated February 19, 1889, to string temporarily four wires from 7th avenue along 23d street to Proctor & Turner's new Theatre, as follows:

"This is an application to run 4 wires to Proctor's Theatre, about 450 feet along 23d street, and the applicant has a contract for lighting the premises. There is a line of poles of the United States Illuminating Company on which these wires could be run. These lines asked for were put on these poles by the Manhattan Company, and were cut down immediately by the United States Company. The place could also be reached through subways from existing subways on Sixth avenue, by building branch duct, running westerly from Sixth avenue about 450 feet, along either 24th or 23d street."

Mayor Grant offered the following resolution:

Resolved, That the application of the Manhattan Electric Light Company, Limited, dated February 19, 1889, to string temporarily four wires from 7th avenue along 23d street to Proctor & Turner's new theatre, about midway between 6th and 7th avenues, be denied.

Unanimously adopted.

Expert Wheeler stated, in reference to a number of applications of the Metropolitan Telephone and Telegraph Company, that he had divided them into three groups, and that those in each group were much alike. On one of these groups his committee had reported as follows:

"The applications are for wires in districts where there are subways."

Mayor Grant offered the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, to which is annexed the report: "These applications are for wires in districts where there are subways," are denied.

Unanimously adopted.

On another group of applications of the Metropolitan Telephone and Telegraph Company, the Engineer and Expert reported as follows:

"These applications to make sundry telephone connections require wires in streets where there are no subways. The wires are to fulfill contracts for ordinary commercial service."

Mayor Grant offered the following resolution:

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company, to which is annexed the report—"These applications to make sundry telephone connections require wires in streets where there are no subways"—be laid over until such time as the Board may adopt a policy in regard to them.

Unanimously adopted.

On another group of applications of the Metropolitan Telephone and Telegraph Company, the Engineer and Expert made the following report:

"These applications are to run metallic circuits or double wires in various places. They are for permits to finish work already partially completed, to make a first-class private line for the Adams Express Company. The route is partly in streets in which there are no subways, and partly in streets where there are subways."

Mayor Grant offered the following resolution:

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company to run metallic circuits or double wires in various places therein respectively designated, in order to make a private line for the Adams Express Company, be laid over until such time as the Board may adopt a policy in regard to them.

Unanimously adopted.

The Engineer and Expert reported on the application of the Western Union Telegraph Company, dated February 16, 1889, to string four wires on existing poles in 65th street, from the Ninth Avenue Elevated Railroad structure to the Western Union Telegraph office in Stock Yards, 65th street and North River, and to string four wires on existing poles in 41st street, from Ninth avenue to the Elevated Railroad, to be connected into the Western Union office at 41st street and 11th avenue, as follows:

"There are existing pole lines sufficient to carry this wire. There are no subways on these streets."

Mayor Grant offered the following resolution:

Resolved, That the application of the Western Union Telegraph Company, dated February 16, 1889, to string four wires on existing poles in 65th and 41st streets, as therein more particularly specified, be denied.

Unanimously adopted.

Engineer Kearny and Expert Wheeler reported on the application of the Metropolitan Telephone and Telegraph Company, dated February 23d, 1889, to string ten wires from Kings Bridge, one and one-half miles north, as follows:

"These wires have been completed from Albany. They are for public service. It is intended to bring them through the lower part of the city in subways. Permission is asked virtually to connect the long lines with the subways across the Annexed District of the city. There are no subways in this district."

Mayor Grant offered the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated February 23, 1889, to string ten wires from Kings Bridge, one and one-half miles north, be granted.

Unanimously adopted.

Engineer Kearny and Expert Wheeler reported on the application of the Metropolitan Telephone and Telegraph Company, dated February 14, 1889, to build a pole line on 79th street, from Avenue B to Fifth avenue, setting 42 poles, with cross-arms attached, and for stringing wire on same, as follows:

"This application is barred out under Board's resolution not to grant trunk lines. The large number of wires proposed to be strung could be accommodated by building a subway through this street."

Mayor Grant offered the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated February 14, 1889, to build a pole line on 79th street, from Avenue B to Fifth avenue, with cross-arms attached, and for stringing wires on same, be denied.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That a plan for a subway be brought in by our Engineer on 79th street.

Unanimously adopted.

The Engineer and Expert reported on applications of the United States Illuminating Company, dated respectively February 17th, 20th and 20th, 1889, to stretch wires as therein respectively specified, as follows:

"Involve the stringing of a quantity of wire. As this is of questionable advisability, they are not reported on favorably until time is had for further consideration."

Mayor Grant offered the following resolution:

Resolved, That the three applications of the United States Illuminating Company,

dated respectively February 17th, 20th and 20th, 1889, to string wires and make connections as therein respectively indicated, are denied.

Unanimously adopted.

Commissioner Moss offered the following resolution:

Resolved, That when the Board adjourns it adjourn to meet on Thursday, March 7th, 1889, at 12 o'clock, noon.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That the Secretary be directed to transmit to the Board of Police immediately duplicates of the permits for the erection of poles and stringing of wires to be issued under resolutions passed at this meeting.

Unanimously adopted.

On motion of Commissioner Moss, the Board adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, March 7th, 1889.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read and approved.

The following communication was read:

BOREEL BUILDING, 115 BROADWAY.
NEW YORK, March 6th, 1889.

The Board of Electrical Control:

GENTLEMEN:—There is an old Fire Department Telegraph pole in front of the building on n. w. cor. of Broadway and Bleecker street, on the Mercer street side. It does not, so far as I am able to learn, carry anything but dead wires. As I am about to put in a new vault all around the building, this pole is in the way and will have to be moved or cared for during the construction. Will you kindly examine said pole, and if you can have it removed, please do so and very greatly oblige. Kindly let me hear from you and oblige.

Yours respectfully,

STEPHEN D. HATCH,
M'CABE.

Mayor Grant offered the following resolution:

Resolved, That the Secretary be directed to communicate with the Fire Department in relation to its pole at the northwest corner of Broadway and Bleecker street, complained of by Mr. Stephen D. Hatch, and report to the Board at its next meeting.

Unanimously adopted.

The following communications from the Western Union Telegraph Company were read:

New York, February 2, 1889.

Board of Electrical Control, 1218 Broadway, City:

GENTLEMEN:—The following is a record of the poles and wires taken down by this Company since January 1, 1888:

Third avenue, west side, 30 wires, from 130th to 5th street, thence through 5th street to Second avenue, Chrystie, Bayard, Market, East Broadway, Chatham and Park Row.

The United States Line, 15 wires, from Market, Division, Essex, Avenue A, 23d street, First avenue, 39th street, Second avenue, 55th street to East River.

Grand street, from Chrystie to Pitt, 6 wires.

4th Ave., 110th to 130th street, 10 wires.

110th street, 3d to 4th avenue, 10 wires.

55th street, 3d to 10th avenue, 6 wires.

55th street, 10th avenue to North River, 15, 5 wires.

40th street, Broadway to Second avenue, 8 wires.

41st street, Sixth to Seventh avenue, 8 poles, 4 wires.

41st street, 7th to 9th avenue, 8 wires.

46th street, Third to Fourth avenues, 4 poles, 5 wires.

46th street, 4th to 6th avenues, 10 poles, 20 wires.

46th street, 5th to 7th avenue, 10 poles, 8 wires.

6th Ave., 46th to 41st street, 8 wires.

A. & P. line, from Centre street to Marion, Prince, Elizabeth, Houston, Second street, First avenue, 21st street, Second avenue, 110th street, First avenue, 124th street, Second avenue, 125th street, Third avenue to Harlem River, 6 wires.

10th street, Avenue A to Dry Dock, poles and 3 wires.

7th avenue, 38th to 43d street, 12 wires.

8th avenue, 59th to 79th St., 12 wires.

8th avenue, 79th to 106th St., 5 wires.

9th avenue, E. side, 17th to 55th St., all poles & wires.

9th avenue, W. side, 53d to 13th St., Washington and Christopher, 14 wires.

10th avenue, 10 poles north from 42d street.

10th avenue, 15th to 30th street, 8 poles.

Broadway, 34th to 59th street, 12 wires.

11th avenue, 15th to 55th street, 63 poles, 5 wires.

West street, Desbrosses to Chambers, 10 wires.

West St., Desbrosses to 10th Ave. and 55th St., 6 wires.

15th St., 10th to 11th Ave., 8 poles, 4 wires.

The removal of all these poles and wires was made possible by the use of the structures of the Elevated Railways for our cables, by permission of your Board.

We are now engaged in placing cables on the elevated structure to connect at 23d street and Fifth avenue with the underground conduit, up Broadway to 34th street, thence to 58th street by elevated, which connections, when completed, will enable us to take down the poles on Sixth avenue north of 23d street, and on Broadway, between 34th and 14th streets, provided the City removes its wires therefrom.

In addition to the detailed statement above, we have taken down from house-tops, and otherwise, in the lower section of the City, during the year, about 100 miles of overhead wires, and expect, early in the coming spring, to connect sufficient cables through the subway from this building to Piers 13 and 18, to release about 100 overhead wires between those points.

Very respectfully,

W. C. HUMSTONE, Superintendent.

NEW YORK, March 6, 1889.

Board of Electrical Control, 1218 Broadway, N. Y.:

GENTLEMEN:—Supplementing my report of February 2d, I beg leave to give below, for your information, a statement of poles and wires taken down by this Company during the month of February:

On 53d street, between Sixth and Seventh Ave's, 4 poles.

On East 11th St., between Avenue C and D, 9 poles.

On Avenue D, between 10th and 11th streets, 3 poles and one-half mile of wire.

On Washington street, between Christopher and Duane street, 20 miles of wire.

Very respectfully,

W. C. HUMSTONE, Superintendent.

Commissioner Gibbens stated that there was a communication before the Board from the Department of Street Cleaning, addressed to his Honor the Mayor, accompanied by a letter from the Metropolitan Telephone and Telegraph Company and one from the Mayor's Private Secretary, asking that permission be granted for a transfer of its telephone service from the temporary board at 46th street to the permanent board at 47th street, North River.

Mayor Grant offered the following resolution:

Resolved, That the application of the Department of Street Cleaning, contained in the communication of its Commissioner, dated March 5th, 1889, for a permit for a transference of its telephone service from the temporary dumping board at the foot of 46th street to the permanent dumping board at the foot of 47th street, North River, be denied.

Unanimously adopted.

The following communication from Police Commissioner Voorhis was, on motion of Commissioner Gibbens, ordered to be spread on the minutes:

NEW YORK, March 2d, 1889.

HON. DAN'L L. GIBBENS, 1218 Broadway:

DEAR SIR:—I learn from Acting Superintendent Byrnes that you desire some information in relation to permits supposed to have been issued by the Police Department to Police Signalling Companies allowing them to string wires and to exhibit their systems—and in connection with the matter will say that this Department has never issued any permits for the stringing of wires for the exhibition, by the various parties, of their apparatus for police signalling purposes; but requests in their behalf were made to the Fire Department in some instances for the temporary use of their poles for the purpose of exhibiting the merits of their systems, which wires the Fire Department has long since requested them to remove. In the case of the Herzog Teleseme Company, an application was made to the Subway Commission for some courtesies to be extended them in order to enable them to exhibit what they desired.

The experiments of all the rival parties having been concluded, there is no further necessity for the privilege being extended, for experimental purposes, to any that I am aware of.

The various Companies who strung wires and exhibited their systems to this Department were:

Pearce & Jones, 79 John street, City.
Gamewell Fire Alarm & Police Signal Co., 1½ Barclay St.
Brewer & Smith, Visual Signal Co., New Haven, Conn.
Municipal Signal Co. (Jno. C. Wilson, Supt.), Boston, Mass.
Herzog Teleseme Company, 30 Broad street.

Any further information that may be in my possession, in connection with this matter, I will very gladly furnish you.

Respectfully yours,

JOHN R. VOORHIS,

Per A. F. S.

The following communication was also, on motion of Commissioner Gibbens, ordered to be spread on the minutes:

OFFICE OF THE SUPERINTENDENT OF TELEGRAPH,

No. 300 MULBERRY STREET,

NEW YORK, March 5th, 1889.

HON. STEPHEN B. FRENCH, Pres'dt Board of Police:

SIR:—In addition to the report herein contained, showing the route of the Police wires, I desire to add the following:

About the year 1861 the Police Department poles, which had been in use since the establishment of the Police Telegraph System, had become decayed. During this period the different telegraph companies then in existence were erecting lines of poles throughout the city. In many cases the poles so erected were on the same route as the police lines, and it was deemed advisable to run the Police wires on these poles, for the reason that it saved the city the expense of erecting new poles, while it

answered our purposes equally as well as if new poles were erected. In consequence of this action the Police Department has no poles south of 125th street.

In view of the fact that the Police wires are run on the poles of the W. U. Telegraph and the Metropolitan Telephone Companies, police communication would be seriously impaired should these poles be removed until further provision be made for Police wires.

Within the past two months we received notices from the Bureau of Incumbrances to remove our wires from certain lines of poles, and in one case the notice was so short that we could not remove the wires before the men employed by the Bureau of Incumbrances proceeded to cut down the poles. The effect of this action was that police communication with the eastern telegraph section was entirely cut off for several hours.

The main portion of the police plant is divided into five (5) telegraphic sections, known and described as North, South, East, West and Central Sections, which connect all the police stations in the city with Headquarters, and with one another.

The route of the North Section is as follows: From Central Office to Mott street, to Houston street, to Second avenue, to 23d street, to 3d avenue, to 100th street, to 4th avenue, to Harlem Bridge, thence to Tremont on the line of the Harlem Railroad.

Route of South Section: From Central Office to Houston street, to Mulberry, to Spring, to Marion, to Centre, to Canal, to West Broadway, to Leonard, to Hudson, to Franklin, to Vestry, to Chambers, to Frankfort, to William, to John, to Dey, to Church, to Greenwich, to Rector, to West, to State, to Whitehall, to Pearl, to Old Slip, to South, to Roosevelt, to Oak, to Madison, to Hester, to Elizabeth.

Route of East Section: From Central Office to Houston, to 1st avenue, to 5th street, to Essex street, to Broome, to Eldridge, to Attorney, to Clinton, to Madison.

Route of West Section: From Central Office to Bleecker, to 8th avenue, to 125th street.

Route of Central Section: From Central Office to Bleecker, to Mercer, to Wooster, to Prince, to 6th avenue, to 30th street, to B'way, to 27th street, to 4th avenue.

Very respectfully yours,

JAMES CROWLEY, Supt. of Police Telegraph.

The following communication from the Mutual District Messenger Company was read:

NEW YORK, March 4th, 1889.

THEODORE MOSS, ESQ., Sec'y of the Board of Electrical Control, 1218 Broadway, City:

DEAR SIR:—In answer to your communication of Feb. 18th, regarding the removal of poles, I would respectfully state that this Company have no poles in the streets or avenues in this city.

Very truly,

W. W. RIDER, General Manager.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to communicate with the Mutual District

Messenger Company, as in the case of the other Messenger Company, namely, the American District Telegraph Company, under a resolution adopted at the last meeting of the Board.

Unanimously adopted.

The following application of the Metropolitan Telephone and Telegraph Company was read:

NEW YORK, March 5, 1889.

The Honorable, the Board of Electrical Control, 1218 Broadway:

GENTLEMEN:—Permission is hereby requested from your honorable Board to allow this Company to erect a new pole, to take the place of the present one, on the corner of 42d street directly east of Madison avenue, for the purpose of terminating our underground wires that are to be placed in the subways on 42d street, between Sixth and Madison avenues.

If this permit is granted we shall be enabled to take down ten (10) poles, and remove all our wires between the above mentioned avenues.

Yours respectfully,

W. H. ECKERT, Gen'l M'gr.

Engineer Kearny reported on the application of the Metropolitan Telephone and Telegraph Company, stating that the pole at the point named was a small one at the end of the subway, and that a new and larger pole would be necessary to support the strain of the wires running east; that the pole will require a box which will further add to the weight and strain; and that he favored the granting of the application.

Mayor Grant offered the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated March 5, 1889, to erect a new pole, to take the place of the present one, on the corner of 42d street, directly east of Madison avenue, be granted.

Unanimously adopted.

The following communication from the Fire Department was read:

NEW YORK, March 5th, 1889.

To the Hon. Board of Electrical Control, No. 1218 Broadway, N. Y. City:

GENTLEMEN:—I have the honor to request that this department be informed of such subway extensions as are in contemplation for the coming season.

It is the desire of this department to remove as many of its poles as possible along the present subway routes "at this time," but in so doing many changes will be necessary to overhead wires, and it is important that such changes be made with the view to such further subway facilities as are to be provided in the immediate future.

Very respectfully,

J. ELLIOT SMITH, Superintendent.

Commissioner Gibbens offered the following resolution:

Resolved, That the Engineer confer with the Superintendent of the Fire Department Telegraph as fast as plans for subways are adopted.

Unanimously adopted.

Engineer Kearny stated, in reference to the resolutions of the Board at its last meeting, directing him to bring in plans for subways in certain districts, that he had addressed communications to the several companies operating in those localities, in order to ascertain their requirements, and that he had up to the present time only received three answers. He further stated, in answer to an inquiry of Mayor Grant as to the plans for subway work during the coming summer, that a large portion of the work ordered last year had not been completed, and that he would bring in a detailed statement of that work and of the portion of it which remained unfinished.

Commissioner Gibbens—There is a communication from the United States Illuminating Company, addressed to the Board, to the effect that the permission given to them by the Mayor to make a test of ten lamps has been accepted, and those lamps are to be placed on gas lamp posts, by the permission of the Department of Public Works. I see no objection to that. Inasmuch as the Company is allowed to make a test, let it make it on the lampposts.

Commissioner Gibbens—I have received a communication from Mr. William Maver, Jr., to the effect that he has some information regarding the insulation of electric light wires underground which he will be pleased to place at the disposal of the Board as soon as he can put it into readable shape. I have told Mr. Maver I would lay the matter before the Board as soon as he is ready.

Commissioner Gibbens offered the following resolution:

Resolved, That a communication of Frederic Nicholls, of Toronto, Canada, dated February 22d, 1889, requesting information in reference to underground wires in this city, be answered by the Secretary.

Unanimously adopted.

Commissioner Gibbens stated that there were a large number of applications before the Board to make connections with existing lines, etc.

Mayor Grant offered the following resolution:

Resolved, That all the applications before the Board from the various electrical companies, for the erection of poles, stringing of wires or making of connections, be laid over.

Unanimously adopted.

The following communication of the Consolidated Telegraph and Electrical Subway Company was read:

N. Y., MARCH 7TH, 1889

To the Honorable, the Commissioners of the Board of Electrical Control, HON. JACOB HESS, President, 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith beg leave to submit for your approval and authorization the following lines of electrical subways for construction during the present season, and for which we ask your favorable consideration, viz.:

1. A telephone and telegraph crossing on B'way at 19th St.
2. " " " " " " 22d "
3. " " " " " " 40th "
4. " " " " " " 41st "

These crossings to accommodate the special requirements of the Western Union Telegraph Company at this time, and to consist of wrought iron pipe laid in hydraulic cement concrete, to terminate in small cast iron manholes, as constructed in other similar cases.

5. A telephone and telegraph crossing on Madison avenue at 42d street.

This crossing to accommodate the special requirements of the Metropolitan Telephone and Telegraph Company at the present, and to consist of same construction as that recommended above, namely, wrought iron pipe laid in hydraulic cement concrete, as used in the rest of this particular subway.

6. An electric light crossing on Sixth Ave., at 49th St.
7. " " " " " " 56th "

These two crossings to accommodate the special requirements of the Manhattan Electric Light Company at this time. Construction to consist of the Johnstone cast iron conduits of six ducts, with small cast iron manholes in conformity with the other crossings on Sixth Avenue.

8. An electric light crossing on Broadway and 30th St.

This crossing is for the accommodation of the United States Illuminating Company for the connections required by them at this time, and to consist of Johnstone cast iron conduit of six ducts, the same as used for other electric light crossings on Broadway.

It is very desirable that this work be done without any unnecessary delay as the Companies referred to require the same in order to utilize the cables which they have placed and are placing in the subways.

Very respectfully,

E. LAUTERBACH, President.

Mayor Grant offered the following resolution:

Resolved, That the communication of the Consolidated Telegraph and Electrical Subway Company, dated March 7, 1889, be referred to the Engineer.

Unanimously adopted.

Commissioner Hess offered the following resolution:

Resolved, That, when the Board adjourns, it adjourn to meet on Tuesday, March 12th, 1889, at 12 o'clock noon.

Unanimously adopted.

Mayor Grant submitted a communication, addressed to him as President of the Board, signed by a committee of Telegraphers' Union No. 6, stating that the union numbers five hundred men, the majority of whom are out of work, and asking the Board that it allow work to be done in the streets where there are no subways. The Board ordered the communication placed on file.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Tuesday, March 19th, 1889.

Present: Mayor Hugh J. Grant, President; Commissioners Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read and approved.

The following application was read:

To the Honorable, the Board of Electrical Control in and for the City of New York:

GENTLEMEN:—The Municipal Electric Power Company, a corporation duly organized in February, 1889, under and pursuant to the Manufacturing Corporations Act, so called, passed February 17, 1848, and the amendments thereto, with lawful right to manufacture and use electricity for producing light, heat or power, as contemplated by the Act, Chapter 73, of the Laws of 1882, passed April 17, 1882, entitled "An Act to authorize Gas Light Companies to use Electricity instead of Gas for lighting streets, public places and public and private buildings in cities, villages and towns within this State," respectfully requests your Honorable Board, under and pursuant to the provisions of Section I. of the Act, Chapter 716, of the Laws of 1887, entitled "An Act in relation to electrical conductors in the City of New York," to consent that your petitioner may have power to lay, erect and construct suitable wires or other conductors, with the necessary poles, pipes or other fixtures, in, on, over and under the streets, avenues and public parks and places of the City of New York, for constructing and distributing electricity within the said city, under such reasonable regulations as your Honorable Board may provide.

And the said Municipal Electric Power Company further respectfully requests your Honorable Board to exercise all powers conferred upon it by the said Act, Chapter 716, of the Laws of 1887, and by any prior or other law of this State, to enable your petitioner to begin and prosecute the transaction of the business for which it was organized, and to erect, locate and construct electrical conductors in the City of New York, and through the said streets, avenues, public parks and places thereof,

upon such terms and conditions as the public convenience and welfare may require, and as your Honorable Board shall determine to be proper.

In witness whereof, the said Municipal Electric Power Company has caused this application to be signed by its president and attested by its secretary this 19th day of March, 1889.

THE MUNICIPAL ELECTRIC POWER CO.,

THOS. F. HAYES, President.

NICHOLAS R. O'CONNOR, Sec'y.

Mayor Grant offered the following resolution:

Resolved, That the application of The Municipal Electric Power Company, dated March 19th, 1889, for a franchise, be referred to Commissioner Gibbens.

Unanimously adopted.

The following petition was read:

NEW YORK, March 18th, 1889.

To the Board of Electrical Control, New York City:

GENTLEMEN:—The Municipal Electric Power Company, a corporation duly organized under the laws of the State of New York, and now preparing to operate an Electric Power Station in One Hundred and Second street, between 2d and 3d avenues, respectfully petitions your Board to cause subways to be constructed on 1st, 2d and 3d avenues, from Eighty-sixth street to the Harlem River, in which we propose to place wires necessary for our business.

Respectfully submitted,

THE MUNICIPAL ELECTRIC POWER CO.,

By NICHOLAS R. O'CONNOR, Sec'y.

Commissioner Gibbens offered the following resolution:

Resolved, That the petition of the Municipal Electric Power Company, dated March 18th, 1889, that the Board cause subways to be constructed on First, Second and Third avenues, from 86th street to the Harlem River, be referred to the Engineer.

Unanimously adopted.

The following communication of Alderman Walker and report of Engineer Kearny thereon were read:

NEW YORK, March 11, 1889.

To the Honorable, the Board of Subway Commissioners:

GENTLEMEN:—I herewith take the liberty of calling your attention to the fact that it is in contemplation to repave the carriage way of Hudson street, from Chambers to 14th street, with pavement of the most durable character—block pavement, with

a concrete foundation; that a portion of the work has already been let to contract, and the remainder will shortly be so let, by the Commissioner of Public Works; that it will be most difficult to remove said pavement, after being laid, and almost impossible after removal to replace it in a good condition, and, if so removed or displaced, great damage and loss will result to the City and the owners of property. Wherefore, it is herewith respectfully submitted to your Hon. body that you take immediate measures to have the electrical subway placed in the said street in advance of such repaving.

WILLIAM H. WALKER, Ald. 9 Dist.

NEW YORK, March 19, 1889.

To the Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN:—I respectfully report on the communication of Alderman Walker, in relation to building a subway in Hudson street.

That we have constructed subways in Hudson street, from Worth to Canal, and that no subway will be required north of Canal street for some time to come.

Very respectfully,

HENRY S. KEARNY, Engineer,

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to reply to the communication of Hon. William H. Walker, Alderman, stating the substance of the Report of the Engineer.

Unanimously adopted.

Mayor Grant stated that, by an arrangement he had made with the Commissioner of Public Works, that official would give the Board notice of streets about to be repaved, so that, if it desires subways in such streets, their construction can be accomplished at the time of such repaving with less inconvenience and at a saving of expense.

The following communication was read:

NEW YORK, March 13, 1889.

HON. HUGH J. GRANT, Mayor of N. Y. City:

MY DEAR SIR:—Some 300 of our people, business men, have engaged electric lights, but, as I understand it, our Electric Lighting Co., the North New York Lighting Company, can't furnish them because you won't allow them to string up any more wires. I hope you will let up on them and grant them permit to do so. We have no subways up here, and the wires they will use will be strung on poles already erected. Give our business people here a chance to display themselves.

Also please favor all improvements you can for up this way—especially graded streets and sewers.

Yours very truly,

GEORGE C. GOELLER,

3d Ave. & 134th Street.

Mayor Grant offered the following resolution:

Resolved, That the Secretary be directed to communicate with George C. Goeller and inform him that the application of the North New York Lighting Company to string wires in his locality is laid over for the present.

Unanimously adopted.

The following communication from the Western Union Telegraph Company was read:

NEW YORK, March 11, 1889.

Board of Electrical Control, 1218 Broadway, N. Y.:

GENTLEMEN:—I beg to call your attention to my application of January 31, for permission to set six (6) poles on St. Nicholas avenue, between 130th and 140th streets, to replace those reported by the Police Department to be rotten and dangerous.

I consider it necessary for the public safety that these poles be renewed at once, and respectfully ask the action of your Honorable Body thereon.

Very respectfully,

W. C. HUMSTONE, Superintendent.

Commissioner Gibbens: I am informed that these poles are in a dangerous condition; but I am also informed that there is a line of poles, which is at present occupied by certain wires of the Western Union Telegraph Company on the other side of the street. I offer this resolution:

Resolved, That the Secretary be directed to communicate with Mr. Humstone, Superintendent of the Western Union Telegraph Company, instructing him to transfer the wires from the poles on St. Nicholas avenue, stated by him in his communication to the Board of March 11, 1889, to be rotten and dangerous, to the poles on the other side of the street, and to remove the rotten and dangerous poles at once.

Unanimously adopted.

The following communications were read:

THE CANADIAN PACIFIC RAILWAY CO.,

NEW YORK, March 18, 1889.

Board of Electrical Control, New York City:

GENTLEMEN:—Some time ago I contracted with the Manhattan Electric Light Co. to furnish electric light at premises, No. 353 Broadway. The wiring of the building has been completed for a long time, but we are unable as yet to obtain light. In explanation as to why is best told by the enclosed letter from the General Manager of that Company to us.

We are suffering very serious inconvenience from the premises not being lighted, and we have several sub-tenants who threaten to cancel their leases unless we comply

with the conditions of said leases, to wit, "to light the premises by electricity." Two of the tenants whose rent amounts to more than \$3,000 per annum will probably leave us unless we can comply with their demands. I, therefore, beg that your Honorable Body will give this matter prompt attention, and, if possible, permit us to make the necessary connection.

Yours truly,

E. V. SKINNER, Gen'l East'n Ag't.

THE MANHATTAN ELECTRIC LIGHT CO., LIMITED,

NEW YORK, March 15, 1889.

E. V. SKINNER, ESQ., C. E. A. Canadian Pacific Railway Company, No. 318 Broadway, City:

DEAR SIR:—Your favor of the 11th inst. duly received. An unusual pressure of important business has prevented an earlier reply. I beg to assure you that we are exceedingly anxious to furnish you with light at the very earliest possible moment. Just at present, however, we are helpless. Although our wires are within twenty feet of your door, we cannot make the necessary overhead connection until a special permit to do the work is granted by the Board of Electrical Control. This we hope to secure soon.

At the time we made our contract with you we were working under a permit which would have enabled us to reach the inside of your building, but which, in common with all other permits granted by the Board to this and all other companies, in the City of New York, has since been revoked.

Trusting you will accept this explanation, I am

Yours respectfully,

E. A. LESLIE, General Manager.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to communicate with Mr. E. V. Skinner, General Eastern Agent of the Canadian Pacific Railway Company, and inform him that the application of the Manhattan Electric Light Company to make the connection desired by him, in common with other applications of a like nature, is laid over at present.

Unanimously adopted.

The following communication was read:

ELECTRIC POWER COMPANY,

NEW YORK, March 11, 1889.

THEODORE MOSS, ESQ., Sec'y Board of Electrical Control:

DEAR SIR:—Your letter of February 18th came duly to hand.

We found, upon investigation, that there were no subways in any of the streets or avenues where we have our conductors. We have, therefore, been unable to place any of them under ground, as requested in your notice of November 16th, 1888. Until

the necessary subways are provided, it will be impossible for us to estimate the amount of time required to enable us to avail of them.

Yours truly,

H. A. HAWKESWORTH, Prest.

Commissioner Gibbens stated that a communication had been received from the Mayor's Private Secretary transmitting, with a newspaper clipping, a communication from W. M. Allison recommending the employment of Prof. P. H. Van der Weyde by the Board of Electrical Control. The Board ordered the communications placed on file.

The following communication was read:

MAYOR'S OFFICE,

NEW YORK, March 12, 1889

DANIEL L. GIBBENS, ESQ., Commissioner Board of Electrical Control:

SIR:—On behalf of the Mayor, I beg to inform you that the Commissioner of Public Works, reporting upon your communication of the 6th instant, states that, on inspection, the Superintendent of Incumbrances was unable to find the wires mentioned by you, and that the Brush Company must have removed them before the receipt of the Mayor's communication. Yours respectfully,

THOS. C. T. CRAIN, Secretary.

Commissioner Gibbens stated that the Mayor's Private Secretary had transmitted to the Board a communication from Fred H. Whipple addressed to his Honor the Mayor, requesting information as to the practicability of burying high tension arc light wires, etc. On motion of Mayor Grant, the communication was referred to Expert Wheeler to reply to it.

The following report of Engineer Kearny was read:

NEW YORK, March 19, 1889.

To the Board of Electrical Control:

GENTLEMEN:—Pursuant to your resolution, I recommend the construction of subways for electric light and power conductors, as follows:

First. On the east side of Sixth avenue, from 14th to 18th streets, being a continuation of last year's work, to consist of Johnstone System, 9 ducts.

Second. On the west side of Sixth avenue, from 14th to 24th streets, to consist of the Johnstone System, 6 ducts.

Third. On 14th street, south side, from First to Sixth avenues, to consist of the Johnstone System, 16 ducts.

Fourth. In 29th street, from Fifth avenue to First avenue, to consist of iron tubes laid in hydraulic cement, 20 ducts.

In reference to the work ordered by the Board last year and not completed, I recommend that it be proceeded with as rapidly as possible.

In addition to this, I recommend subways for telephone and telegraph service the following continuations of last year's work and of the work ordered last year, the material and construction to be the same as the completed work of which they form the continuation:

Through Murray street, from College place to Broadway;
Centre street, from Worth to Grand;
East Houston street, from Crosby to First avenue;
38th street, from Lexington to First avenues;
79th street, from First to Park avenues;
Lexington avenue, from 65th to 79th streets.

Regarding new trunk lines for electric light, as well as for telephone and telegraph service, I would respectfully request further time before making any recommendation.

Very respectfully,

HENRY S. KEARNY, Engineer.

Commissioner Gibbens offered the following resolution:

Resolved, That the Report of the Engineer, dated March 19, 1889, relating to new work, be approved, the work described therein be ordered, and the Secretary be directed to communicate with the Consolidated Telegraph and Electrical Subway Company and request it to begin the work immediately and proceed with it as rapidly as possible.

Unanimously adopted.

The Board ordered the following reports of the Electrical Expert to be spread on the minutes:

REPORT OF ELECTRICAL EXPERT.

Detail of all Notices of Violations of Rules and Regulations, Sent from January 15th to February 15th, 1889.

	No. of Viol'ns.	No. of N's. Sent.	2nd Notices.	Notices Answered.	Notices Att'd to.	Not's sent to B. of I.
Met. T. & T.—Dead W's.....	9	6		6	6	
U. S. Co.—Dead Poles, Dead Wires	9	3				
W. U. T. Co.—Dead Wires...	12	3		1		1
Useless Poles	4	1				
Brush Co.—Dead Wires.....	4	1		1		
East R. Co.—D's Loop.....	1	1		1		
N. N. Y. E. L. Co.—P'sn'r.						
C. G. L.....	1	1		1		
Fire Dept.—Dead Wires.....	1	1				

	No. of Viol'ns.	No. of N's Sent.	2nd Notices.	Notices Answered.	Notices Att'd to.	Not's sent to B of I.
O'r. U'n. Dead Wires.....	31				6	31
D's Wires.....	1				1	1
	32				7	32
Total	73	17		11	13	33

Number of city blocks inspected, 361.

Bureau of Incumbrances.

Miles of wire removed since January 15, 54 miles.

Number of poles removed since January 15, 180 poles.

REPORT OF ELECTRICAL EXPERT.

Detail of all Notices of Violations of Rules and Regulations Sent from February 16th to March 15th, 1889.

	No. of Viol'ns.	No. of N's Sent.	2nd Notices.	Notices Answered.	Notices Att'd to.	Not's sent to B of I.
U. S. Co.—Dead Wires.....	22	11		5		
Dead Poles	6	2		1		1
Useless Poles	3	2	2	2		
Total	31	14	2	8		1
Brush Co.—Dead Wires.....	9	5				
Dead Poles	12	8				
Total	21	13				
Met. Tel. Co. Dead Wires....	23	13		8		
W. U. Tel. Co.—Dead Wires.	41	29		1		
Am. U. Tel.—Dead Wires....	3	3				
Am. D. Tel.—Dead Wires....	1	1				
N. Y. E. P. Co.—S'k. Q'n. Co.						
Other V's	1	2				
Fire Dept.—Dead Wires.....	15	9				
D's. Wires	1	1				
Total	16	10				
O's. Unk'n.—Dead Wires....	55				5	
Dead Poles	21					
Total	76				5	44
Grand Total	213	84	2	17	5	45

Bureau of Incumbrances.

From February 15th to March 15th removed 236,700 feet wire;
 " " " " " " 16 poles.

The following report of Expert Wheeler was read:

NEW YORK, March 19, 1889.

To the Hon. Commissioners of the Board of Electrical Control:

GENTLEMEN:—I have to report that the lamp at 180½ Bowery has been removed by the Bureau of Incumbrances.

Also that the lamp at 147 Third avenue, owned by the East R. Co., has not been removed.

Very respectfully,

SCHUYLER S. WHEELER, Electrical Expert to the Board.

Mayor Grant stated, in reference to the lamp at No. 147 Third avenue, that he had notified the Commissioner of Public Works to cut it out.

The following report of Expert Wheeler was read:

NEW YORK, March 19, 1889.

To the Hon. Commissioners of the Board of Electrical Control:

GENTLEMEN:—I beg to report that the overhead wires connected to Proctor & Turner's Theatre without a permit of the Board have been removed and have not been re-connected since.

Very respectfully,

SCHUYLER S. WHEELER, Electrical Expert to the Board.

The following report of Engineer Kearney was read:

NEW YORK, N. Y., March 12th, 1889.

To the Honorable, the Commissioners of the Board of Electrical Control, 1218 Broadway, New York, N. Y.:

GENTLEMEN:—I have examined the application of the Consolidated Telegraph and Electrical Subway Company of March 7th, referred to me, and have to recommend that you order forthwith the construction of subways for telephone and telegraph purposes at the following places:

Crossings on Broadway at 19th, 22d, 40th and 41st streets, consisting of 2½ inch iron tubes laid in hydraulic cement concrete; also from manhole near Lincoln Monument, Union Square, to southeast corner University place and 14th street.

For arc light and power conduit, a Johnstone casting crossing Sixth avenue at 49th and 56th streets, and crossing Broadway at 30th street.

Very respectfully,

HENRY S. KEARNY, Engineer.

Commissioner Gibbens offered the following resolution:

Resolved, That the report of Engineer Kearny, dated March 12th, 1889, upon the application of the Consolidated Telegraph and Electrical Subway Company of March

7th, 1889, be adopted, and that the work be ordered and proceeded with as rapidly as possible.

Unanimously adopted.

The following anonymous communication was read:

NEW YORK, March 19th, 1889.

HON. MAYOR GRANT:

The iron poles of the H. & M. E. L. Co. have been condemned by the city authorities. The excuse has been for not taking them down that they had to have a new line of poles to take the place of the iron ones. Now they have put up their new ones from 80th to 130th streets, on the east side of Third avenue, and have strung the wires on the new poles. They have no excuse for not removing the iron poles which are a nuisance and dangerous to the people of that portion of the city.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to instruct the Harlem Lighting Company to remove its iron poles at once.

Unanimously adopted.

Resolved, That the Metropolitan Telephone and Telegraph Company be directed to remove one of its lines of poles on Water street, where it has two lines of poles.

Unanimously adopted.

Resolved, That the Secretary be directed to communicate with the Western Union Telegraph Company and order that Company to remove one of its lines of poles on Hudson street, where it has two lines.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That the application before the Board from electrical companies for overhead wires, etc., be laid over.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the Board adjourn subject to the call of the Chair.

Unanimously adopted.

The Board then adjourned.

Minutes of a Special Meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Monday, April 1st, 1889, at 12 o'clock noon.

Present:—Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel J. Gibbens and Theodore Moss.

Mayor Grant stated that the object of the meeting to be the consideration of the subject of the explosion of gases in the subway conduits. He called upon Mr. Edward J. Lauterbach, President of the Consolidated Telegraph and Electrical Subway Company, as the representative of that company, to make a statement in reference to the matter.

Edward J. Lauterbach: I appear as President of the Consolidated Telegraph and Electrical Subway Company. I think it my duty to present to the Board of Electrical Control the situation which has called this meeting together in the way that my Company understands it.

The Consolidated Telegraph and Electrical Subway Company is required by law to obey the behests of the Board of Electrical Control. Its construction in the City of New York is subject not only to the direction of its own engineers and to the supervision and criticism of the engineers of the various electrical companies that intend to use it, but it is made especially subject to the actual control and supervision of the Department of Public Works—not only for the purpose of regulating the use of the streets, as in the case of gas and other companies, but also generally in respect to the nature of its construction—and then more especially under the control, supervision and management of the Board of Electrical Control, so that we are the agents of the city practically, and occupy a public—quasi-public—if not fully a public situation, in respect to the business that we are called upon to perform.

In consequence of that supervision, and in consequence of the nature of the work that we are called upon to perform, I think it may be truly stated that no work of a public character in the City of New York which involved the use of the streets has ever been performed by any corporation, with greater care, with more attentive study and attention, with a desire to have every scientific test brought to bear upon the character of their proposed subways, and with more thorough supervision, than has been the case of the construction of the conduits or subways in the City of New York. Expense has not been spared, and there has been no hint or suggestion of improvement that it has not been readily made, and we have followed that course from the beginning. There has been a steady evolution toward progress in the work of the subway.

We have met with difficulties, not in the nature of the subway itself, but from the use by other corporations of the sub-soil of the streets of the city beneath the surface. The first radical difficulty that we met with was in the instance of the Steam Heating Company. It appeared that the temperature in the manholes of the Subway Company was raised in many instances to nearly 200 degrees, and that condition of affairs prevailed more especially, almost entirely, in the lower section of the city. A most thor-

ough investigation was made as to the cause of that condition, which was to such an extent as, unless the cables were adequately and thoroughly protected by lead casings, rendered them useless for any purpose. The difficulties, however, were not so great—not at all great in the case of cables that were properly protected and properly encased. The Steam Heating Company came forward and frankly admitted that it knew that the construction of the steam heating pipes in the upper section of the city had been much more thoroughly attended to than in the lower part. And I have here the remarks of Mr. Andrews, the President of that Company, in which he concedes that by the false economy of those having charge of the steam heating work the joining of the pipes of the Steam Heating Company were not as safely and as adequately attended to as it should have been, and that the pipes were subject to great leakage, and states that his Company would do the best it could to avoid the difficulty. And I think it is fair for me to say that the result of the conservative policy pursued under the intervention of the Board of Electrical Control, and between the Company I represent and the Steam Heating Company, has been such that the Steam Heating Company has made strenuous efforts to remove the difficulty, and has to some extent, if not wholly, removed it. I speak of this as the first serious difficulty and the first unexpected difficulty that the Construction Company was forced to cope with.

About a year ago it began to demonstrate itself that there was another difficulty, somewhat unexpected, but provided for as far as skill and ingenuity and excellence of construction in the subway itself could have provided for it, every precaution having been taken against it. It was found that the subways—as had been previously the experience in the sewers in the City of New York and other openings in vaults and manholes pertaining to other conduits in the City of New York—unexpectedly and without adequate explanation explosions would occur suddenly by reason of the presence of illuminating gas, and the first three or four explosions of that kind took place—to which I shall refer in a report—in manholes where there was no electrical current present, where for all practical purposes the manhole might have been simply a hole in the ground, there being no adequate cause—at least so far as the presence of a current was concerned—to account for the explosion.

When it became apparent that the earth was so permeated with illuminating gas as to make it important to do what could be done to prevent its presence in the subways there were made a series of provisions, and portable blowers were purchased and were applied to every manhole two, three or four times—at least once—during the week, and in all cases, in any instance, where the manhole was to be used for any purpose that might be deemed unsafe without such application. Subsequently, at the suggestion of those who had had experience in the matter in other cities, and at the expense of the Electrical Company, a blower of large capacity was put in at one of the uptown hotels. By means of the use of this blower the manholes from 14th to 58th streets were able to be kept in perfectly clean and clear condition.

The construction of the work itself—as will be demonstrated by the Report I will read—was especially calculated, if anything could be calculated, to prevent the entrance

of gas; but it seems to be practically impossible to prevent the entrance of gas in any cavity that exists, whether it be a manhole, pipe or other vacuum. In building the subways, the lines followed were those indicated by the Department of Public Works, which prepared the lines carefully and accurately; and whenever the obstacle of gas pipes were met with, the Company at its own expense removed the gas pipes, replaced and repaired them, and restored the gas mains, in most instances, to a better condition than they were at the time when the construction was taking place.

Commissioner Hess: What Company do you mean?

Mr. Lauterbach: I mean the Consolidated Telegraph and Electrical Subway Company—without exacting any payment, and, generally, under their direction, it did this, whether it were legally bound to do so or not—the reconstruction of the gas mains and their replacement. What the relative rights of the gas companies and the Subway Company may be it is, of course, unnecessary for me to discuss. That is a matter for the Corporation Counsel, and a matter that cannot arise to be discussed at all.

I simply desire to call attention again to the fact that we are engaged in a general public duty, and that the use of the streets by the gas companies while for the use of the public, yet after all they are but private corporations. We expect to receive some emolument or return, but up to the present time our work has been simply for the benefit of the public, and I may also say that the construction is one that will go to the public, the City of New York having the right to acquire the rights when it so desires after an interval of time.

I think these few remarks cover the general situation; and the more specific condition of affairs is best set forth in a report of Mr. Beckwith to myself, not for this last accident, but, on the 25th of February, this matter having been the subject of constant, unintermittant attention of the Board of Directors of the Consolidated Company, and having been referred to the Board of Engineers for report. I think I cannot do better than read the report at this juncture.

REPORT.

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,

No. 18 CORTLANDT STREET,

NEW YORK, N. Y., February 25th, 1889.

MR. EDWARD LAUTERBACH, President Consolidated Telegraph and Electrical Subway Company, 18 Cortlandt Street, New York, N. Y.:

DEAR SIR:—Under the direction of the resolution of the Executive Committee, as communicated to me, "to report at their next meeting upon the general question of the ventilation of the subways, setting forth the measures that have been and are being taken in that direction," I beg to submit the following:

In order to comply with the requirements of the law to put the wires underground, some kind of subway that is hollow and admits of handling of the wires in it is necessary. The loose way in which, during the last forty or fifty years the gas companies,

as well as other corporations, have been allowed to do work in the streets has resulted in the leakage of gas, etc., etc., from the mains into the surrounding ground under the pavement to such an extent that the earth has become permeated with it, and any receptacle underground (sewers, manholes, subways, water gate vaults, streets vaults of buildings, etc., etc.), are certain to become filled with gas which gradually finds its way into them through the masonry, joints, etc. Owing to the conditions existing in underground work of all kinds, settlements, expansion and contraction, deterioration of materials, etc., it is impracticable and entirely prohibitory in the matter of expense to make a construction that will absolutely prevent the infiltration of gas.

When it is considered that an explosive mixture of air and illuminating gas, liable to be ignited by the presence of flame, an electric spark, or any point of active combustion, is produced by the presence of four per cent. of gas, and upwards, the most dangerous proportion being about twelve per cent., it needs no additional argument to show the danger arising from this state of things. The amount of gas which escapes from the mains into the ground is variable in different localities, and is greatest in the older portions of the city where the mains have been longest laid. In opening the streets at different points, it constantly happens that old gas mains are uncovered and found to be in many instances so rusted out that a blow from a pick or even from the heel of a boot will break the iron. In clay or well-packed soil, it has occurred that the earth really forms a sleeve for the passage of the gas and the only obstacle to its leakage. It is a well known fact that in many parts of the city a crowbar driven into the joints of the pavement and withdrawn will give vent to sufficient gas escaping through the ground through the aperture thus formed, to produce, when lighted, a good sized gas jet and flame, frequently burning for a long time unless extinguished. It is reported that the leakage of gas amounts to twenty per cent. and upwards in the older portions of the city, and will average fifteen per cent. at least in the entire city. The gas companies admit about ten per cent. The present construction of mains by the gas companies is much more carefully done than formerly, with correspondingly better results for keeping in the gas, but the great majority of the old mains belonging to the gas companies are at present, and apparently are likely to remain a source of great trouble and danger to other interests from the causes above described. The Standard Gas Company has started the innovation in New York of laying all their mains of wrought iron, lap welded, screw jointed pipe, on the principle, I understand, that the saving of leakage will not only warrant the additional cost of the pipe, but give a very profitable return besides. I may mention here, incidentally, that about seven-eighths of the electrical subways laid in New York City consist of the above construction of wrought iron pipe, but of smaller diameter, laid in hydraulic cement concrete, and that, so far as construction goes, it is clear that the kind of pipe that is best adapted to hold the gas in is also the best adapted to keep it out of the subways.

Explosions from leakages of gas into sewers and basements of buildings, in cities are numerous, and are frequently attended with very destructive results. In Boston a building, not long ago, was wrecked and practically levelled to the ground by the explosion of gas in the basement. In New York in many buildings the trouble from gas in the basement is so great as to require special treatment to check the danger and remedy the inconvenience from the foul air, etc. In the Metropolitan Telephone & Telegraph Company's building the amount of gas leaking in from the street through the masonry of the street vaults, in spite of the frequent repairs to their mains by the gas company, was so great as to imperil the safety of the structure, besides rendering the basement uninhabitable. To correct the trouble

a large low pressure Sturtevant blower was established in the basement and kept in constant operation; this has accomplished the purpose intended, but at considerable expense. Other large buildings in the city have had to be treated in the same way.

The above statement shows the present condition and the danger arising from the leakage of gas in the street. To this trouble may be added that arising from the conveyance of steam which, escaping from the mains in a similar manner, owing to imperfect construction, finds its way into the property of the Subway Company, and, by its heat, acting injuriously upon the structure and seriously affecting the electrical conditions contained therein. It is clear that in principle the Subway Company should not be called upon to incur additional expense, whether in construction or in protective measures or remedies, or bear any responsibility, directly or indirectly, for damages arising from the influence of elements which it is the business of other corporations, who are supplying these elements to the public, to keep within the limits of their own structures. And it would appear as if the responsibility of the gas companies and the Steam Heating Company, etc., for the damages resulting from their failing to keep the gas and steam within the limits of their respective mains, must result in their being held responsible for whatever expenditures the Subway Company may be called upon to make in order to protect themselves.

The next question that arises is with regard to the construction of the subways as adopted in relation to their protection against the infiltration of gas, steam, etc. The greatest care has been exercised in making the ducts, in all cases as tight as possible, and it has been stated above that about seven-eighths of the total amount of ducts are screw-jointed iron pipe, giving the strongest and tightest construction against the passage of gas, steam, water, etc., that is known. The manholes are built of hard-burned North River brick, laid in hydraulic cement, the masonry being cemented on the outside as an additional protection, and the bottoms being made of hydraulic cement concrete. The cast iron frame-work with double street covers, provided with rubber gaskets, is of the heaviest and strongest description. I do not believe that the above construction can be materially improved against the pressure of gas existing in the surrounding ground. As proof of this, I will state that the Edison junction boxes, which are very carefully made of cast iron, with very few flange joints, and those machine dressed and faced, bolted together in the best manner, and which should be tight against gas, if any underground construction can be, are still found to allow the leakage of gas into them; explosions in such boxes having occurred in several instances, stripping off the double sheet covers with the washers and nuts which hold them down.

As the electrical subway cannot be materially improved against the infiltration of gas, pending the improvement of the condition of the gas mains underground, the question now arises what remedial measures have been and can be adopted to diminish the gas troubles. As the subways have been built from time to time and made ready for occupancy, investigation has everywhere shown the presence of gas in quantities varying greatly at different times and in different portions of the city. The opening of manholes for the purpose of alterations, of cleaning, of drawing in and withdrawing cables has offered opportunities for natural ventilation and escape of gas. To enable the men to work in the manholes portable blowers have been used from the street to expel the gas in each manhole (under the Rules and Regulations governing the occupancy of subways, prepared by this Company and approved by the Board of Electrical Control), the ventilation being kept up usually during

the time the work is going on. The system has also been adopted of from time to time, opening successfully the manholes on a line of subway, two manholes in succession being opened simultaneously to allow, in some cases, of the natural circulation of air being established, and in other cases to allow of artificial circulation being produced by the use of the blower. This has been found advantageous in the lower part of the city particularly. Ventilation, in some cases, has been afforded by subsidiary pipes which have been established between manholes to carry cables to the tops of poles or of buildings, the gas escaping through the outlet at the top. The few explosions which had occurred last year in the subways were all capable of explanation through some natural or accidental cause igniting the gas. But recently two explosions occurred in manholes which were locked, which contained no gas pipes and in which no wires were in operation. No satisfactory reason has yet been given to account for the ignition of the gas under these circumstances. It had been believed until then that the danger to be feared of ignition of gas in the manholes was limited to the electric light subways, in which a spark caused by burn-outs or crosses from high-tension currents might cause an explosion, and that the low-tension currents of the telephone and telegraph subways could not give rise to this danger. The conclusion drawn from the last two explosions has been, therefore, that these occurrences may happen in telephone and telegraph subways as well as in electric light subways, and may arise from conditions apparently independent of the presence of electrical conductors in operation; so that the remedy to be applied cannot be limited to one section of the subways, but presumably will have to be applied to all. This greatly increases the scope of the question as a matter of first expenditure and cost, and of running expenses. The question of the cause of the last two explosions is being made the subject of an exhaustive investigation by Albert R. Leeds, Ph. D., Professor of Chemistry, Stevens Institute of Technology, and, as soon as completed, his report will be submitted to you. At this time it is only possible to say that these explosions, without apparent explanation, have only occurred in the lower part of the city, where the conditions underground are complicated by the probable presence of marsh gas and other gases arising from the decomposition of organic matter in made ground.

It was deemed advisable, in view of the possibility of explosions in the electric light subways which had been built in the district extending from 14th to 58th streets, and between 5th and 8th avenues, to test the question by mechanical ventilation for the purpose of expelling the gas. Premises have been rented in the street vaults of the Marlborough Hotel, corner 36th street and Broadway, and a No. 5 Baker pressure blower, run by a steam engine, has been established by this Company at considerable expense, in this location, the steam being rented from the boilers on the premises. The blower was connected by two 12-inch wrought iron ducts with the nearest manhole, and started February 15th, with a pressure of air of a quarter to half a pound per square inch. The manholes were opened at certain points on the line in order to give an exit to the gas, etc. The effect of this blower has been found satisfactory as far south as 14th street and as far north as 58th street, and has given good results in clearing the gas out of the Broadway conduits. It will also be turned on to the Sixth avenue electric light conduit, which extends from 18th to 58th streets. The manholes and ducts which have been ventilated, when opened, show great freedom from gas, which has been expelled from the subways into the surrounding ground. The capacity of the ventilating plant has not been fully tested, owing to certain alterations which have been decided upon to prevent the noise and the concussion of air in the basement from inconveniencing the guests in the hotel. It is well to mention, in this connection, that

the precaution has been taken of plugging with plaster of Paris, etc., all subsidiary connections of the subways ending in buildings, in order to prevent gas from entering the buildings from the subways and creating trouble.

An incidental result of the artificial ventilation of the electrical conduits on Broadway and the expulsion of the gas has been the increase of the gas in the basements of buildings along the line, and the making of numerous complaints (as, I understand, amounting to over thirty the morning after the blower was started), to the gas companies, who, since then, have been energetically engaged in opening the streets in fifty-seven different places, within sixty days from the starting of the blower. The attention of the gas companies, in many other instances, has been called by this Company to troubles arising from the leakage of gas, and, as you are aware, in the construction of subways this Company has paid over large sums of money to the gas companies for the alteration and removal of gas mains from the manholes in the line of the subways and for other work of this character in the nature of precautions against the possibility of future leaks arising from the presence of the gas mains. This Company has taken, and is taking, all measures and adopting all the precautions which experience in this special work has suggested, and when it is considered that the cause of this trouble does not lie in any defect of the subways, but, on the contrary in the neglect of other corporations to keep that which they are chartered to sell within their own structures, it is very desirable that an opportunity should be given to place the responsibility where it properly belongs and to correct the impression that explosions in the subways arise from any cause inherent in them.

Very respectfully,

LEONARD F. BECKWITH, Chief Engineer.

Mr. Lauterbach, continuing: That brings us to the condition of affairs prior to the explosion, the happening of which is the occasion of our being here to-day. The explosions which occurred prior to that were as follows: I will simply give them.

One at the corner of 21st street and Sixth avenue, on May 9th, 1887.

One on November 7th, 1887, in manhole at corner of Warren street and Broadway.

One on December 4th, 1887, in manhole at the corner of Frankfort street and Park Row, which was due to a light placed in the manhole.

One on October 18th, 1888, in manholes at Battery Place and Bowling Green, during a storm, and probably produced by a flash of lightning, the details of which are fully set forth in the paper to which I am referring.

One on February 12th, 1889, in manhole on Pearl street, near Wall. And I desire to say that in that instance, as well as in the other instances to which I have referred, and also in the instance of the Fifth avenue and 23d street explosion, there was always the monitory symptom of an unusual—that there had been an indication that there was an unusual presence of gas at the time.

One on the 13th of February, 1889, in one of the junction boxes of the Edison Company, at the corner of Maiden Lane and Nassau street.

One on February 13th, 1889, in manhole at Nassau and Pine streets, near No. 20 Nassau street, where there was no electric current present.

One on February 15th, 1889, at the Hotel Marlborough, while the blower was being put in and before the subsidiary ducts had been filled with plaster of paris.

And then the explosion at Fifth avenue and 23d street, which it is proper to speak of more specifically, if it is not trenching too much on the patience of the Board.

Mr. Lauterbach then read from the paper to which he had been referring, as follows:

MARCH 25TH, 1889.

FIFTH AVENUE AND 23D STREET.

An explosion of three manholes of the subway took place this morning at 11.45 o'clock. The manholes are situated as follows: No. 1, at southeast corner of Fifth avenue and 23d street; No. 2, at northwest corner of Fifth avenue and 23d street, and No. 3, at angle of Fifth avenue and Broadway, opposite 5th Avenue Hotel entrance, and 144 feet north of No. 2. The heaviest and evidently the central explosion occurred at No. 2.

As far as an examination of the ground and information from eye-witnesses of the explosion can determine, I herewith submit the following report:

The cast iron manhole head of No. 1 must have been thrown up about three feet, turning over as it fell, and leaving it thrown across the open manhole, as shown in sketch No. 1. In this manhole there are twenty $2\frac{1}{2}$ -inch ducts running north and four of various sizes running west. In the $2\frac{1}{2}$ -inch ducts there are six electric, viz.: One Brush Light Company's cable (8 conductors), three United States cables (1 conductor each), and two Manhattan Electric Light Company's cables (1 conductor each). The casting wedged itself diagonally across the manhole, and although the drip-pan was still in place the force directed against it was sufficient to bend the set screw (1 inch in diameter, bronze) and the wrought iron holding-down bar, about twelve inches out of regular shape at one end. The lock and general position of the bar and set screw were as in normal position for service required. This manhole had been opened at 8 o'clock this morning, and was considered in good condition, particularly as to ventilation. For a space of about ten feet in diameter around this manhole the paving stones had been thrown into confusion and lifted probably a foot above their bed, showing the force of the explosion had been directed horizontally under them by the weight and shape of the casting as it was lifted from its bed. The top plate, or cover, was merely thrown off by the motion given to the casting.

In No. 2 the explosion was of greater violence. A flagstone, weighing about 650 pounds, which covered the west side of the manhole, was lifted with the pavement over it, and shifted about 18 inches east of its original position, while the square cast iron head was thrown up probably six feet high, forcing the holding-down bar out of place by breaking the cast iron lug on one side of the frame and breaking the gun metal set screw short off; the lock was not found. The heavy cast iron cover was broken into three pieces and thrown into the position as shown in drawing No. 2. The drip-pan was broken into half a dozen pieces. The iron

bar was thrown about 15 feet away from the manhole. The paving stones and crosswalk for an area of about 12 feet about the centre of the manhole were torn up and loosened (see sketch No. 2). This threw into the air a large quantity of dust and sand, which seemed like the smoke of an explosion. No one of the several who say that they were looking directly at the upheaval noticed any flame. Manhole No. 2 is 28 feet north of No. 1, having the same number of ducts and cables running through it.

The third manhole is 144 feet north of No. 2 and almost opposite the entrance to the 5th Avenue Hotel. The explosion there had slightly lifted the manhole head and blown up the paving stones and crosswalk, as shown in drawing No. 2.

In no case was the brick work of manholes disturbed or cracked, except slightly loosening the two upper rows in Nos. 1 and 2. Two men were working in the manholes on this subway at 25th street, splicing cables for the United States Illuminating Company. They report some effect from the explosion there, but this may be unreliable.

The blowing engine has been in constant operation for five or six weeks past, maintaining an air pressure at 36th street of about four ounces, so that when all manholes have been closed at night a good circulation has been kept up from 58th to 14th street on Broadway, keeping this series of manholes in safe condition against gas accumulation.

The manhole at 25th street being opened this A. M., stopped the ventilation of the 23d street manholes. The gas in these places accumulated rapidly, as there is a great net work of gas pipes at this point, and it is known to be a gassy locality. This combustible material accumulated between the hours of 8.30 and 11.45 A. M., sufficient to make the explosion.

We have positive information that no electrical current was turned into the cables running through these manholes. It is probable that they were lighted by the leak of gas entering the basement under the sidewalk at about 30 feet north of the house line of 23d street, or about 45 feet north of the manhole No. 2, where a 2½-inch subsidiary duct is laid from the Johnstone system for cables of the Manhattan Electric Light Company for lighting up the American Novelty Company's basement. Two cables are put into this 2½-inch duct and no cement has been used to close up the opening. The gas is strong that comes through the duct, and is very perceptible in the room where the duct enters, which is about 10 feet square. There is often burned in this room an open gas jet for heating glue pots. The duct enters the east wall about 8 feet above the floor, and is about 9 feet from the bench on which the glue pot is kept. In lighting a match to set fire to the gas burner it would be possible for the gas coming through the duct to be lighted at the same time, and the occupant of the room not know that he had blown up the subway. It would seem that this is the solution of the explosion on 23d street, as smoke is said to have been noticed in the basement of this building, and since making my investigation it is the only solution that will solve the cause of the explosion.

(Signed)

ROBERT WEIR, Prin. Asst. Engr.

Note.—The sketches mentioned herein are filed with Phoenix letters, included in report, of which the foregoing is a copy.

MARCH 25TH, 1889.

As per your instructions given me this P. M. to get all the information possible in regard to the explosion at 23d street and Broadway, also manhole in front of 5th Avenue Hotel, I beg to submit the following: Messrs. Pat Welch, Geo. Harvey and Charles Wilson, employees of this Company, also Arthur McShane, driver of the New York Transfer Company's cart, informed me that the manhole at the southwest corner of 23d street and 5th avenue and the manhole in front of the 5th Avenue Hotel were cleaned and ventilated this morning from 8.30 to 9 o'clock; no smell of gas and very little water. The manhole at the northwest corner of 23d street and 5th Avenue not cleaned, having been cleaned a few days previous. When I asked Mr. Welch why he did not open it for ventilation, he responded that it was not to be used to-day; on the contrary, the others were to be opened for work being done by the United States Illuminating Company. I then saw Jno. Ward and William Kennedy, splicer and helper for the United States Illuminating Company, the former of the two, Jno. Ward (splicer), was in the manhole at the time of the explosion (25th street and Broadway), and claims that he received a severe shock, taking his breath away; the latter, Wm. Kennedy (helper), says he was at the same manhole and heard the explosion, but saw nothing. I was informed by a policeman, No. 48, and his story was corroborated by Driver Maxwell, of one of the New York Transfer Company's express wagons, that a piece of one of the manhole covers at the northwest corner of 5th avenue and 23d street, about 15 inches square, came very near hitting him; the said piece had risen 12 feet in the air. Driver Maxwell also informs me that his wagon was over manhole in front of the 5th Avenue Hotel at the time of explosion, while he was standing near the door, and furthermore states that the stones were only raised about six inches around said manhole, which shows that cover was not thrown up any distance or it would have struck under side of wagon body. Officer No. 48 also says manhole lid broke flagstone at northwest corner of 5th avenue on its fall. This being all the information I could get from people around the accident, I proceeded to the 19th Precinct, 30th street, between Sixth and Seventh avenues, where I was informed that Officer James Donovan (No. 1001) was on Sixth avenue, near 31st street, to a fire. He stated to me that he saw the explosion, and claims that they commenced from the one in front of the 5th Avenue Hotel and went south. He also says that when the manhole exploded at northwest corner of 23d street and Broadway that a man fell; he started to go to him, but the other manhole at the southwest corner exploded, and by that time the man was up and gone; he does not know his name or whether he was injured. He said the coupe was hit by a piece of stone, and also told me that the name of the lady in the cab at the time was Mrs. Reichheimer, of No. 39 East 75th street, and the driver's name was Benj. Hamilton, of the Orange County Stables (Mason's Stables), 78th street and 4th avenue. I then called at the above mentioned stables and saw Messrs. Mason & Mason at 4.30 P. M.; they said they had not heard anything of the accident. When I tried to get any information they refused to give it to me, as they said they had no right to reveal the lady's name, although they did know it, but I told them that it made no difference, as I had already been informed by an officer. I remained and saw the coupe; it did not return until 5.45 P. M., showing the lady had been out nearly six hours after the explosion, and was probably not injured, as what made the hole in top of coupe did not go through into it, as the head lining was not perforated. Mr. Mason said that it required a new top and that he would send it to the repair shop to-morrow and render the bill to this Company (to which I made no reply, having been instructed by Col. Jameson not to commit the Company in any way). I am satisfied

that it will require an entire new canvas over the whole top after the hole in the wood is repaired, as a top cannot be patched so as to keep the water out without showing the patch, therefore it must be an entire new canvas, painted and varnished, which expense should not exceed ten dollars (\$10), unless he charges for time of coupe while being repaired, which will take about two weeks for paint to dry and be properly finished. I also learned from Officer Donovan that one or more windows of a 23d street car was broken. (Signed) A. S. DODD, JR., Paymaster.

MARCH 25TH, 1889.

I find that Joseph Tetlow, splicer, and Charles Melville, helper, were at work in manhole, 16th street and Broadway, west side, from 10 A. M. to 12 M., making a connection for the M. E. L. Co. They say they felt nothing to indicate an explosion had taken place, except an unusually large quantity of gas came into the manhole at or about 11.55 A. M. These men say they did not have any light or fire in manhole.

John Ward, splicer, and Wm. Kennedy, helper, were at work in manhole at 25th street and Broadway, west side, splicing cable of the U. S. Ill. Co. Ward states that he clearly felt the force of explosion and gas in the manhole where he was working, but did not know at the time the cause. They also emphatically state that they did not have a light or fire of any description in manhole.

I opened 14th street and Union Square manhole, west side, for the M. E. L. Co. to paraffine ends of cable. This manhole was open about ten minutes.

Patrick Welsh, foreman of Subway Gang, opened and cleaned manholes at 23d street and Fifth avenue, s. w. corner, and manhole opposite 5th Avenue Hotel, opening the 23d street manhole at or about 8.30, and had them open fully thirty minutes. He states that these holes were both at that time remarkably free from gas.

Not having any occasion to open the manhole at n. w. corner 23d street and 5th avenue, he cannot say anything about its condition regarding gas.

An affliction called forgetfulness seemed to have taken possession of all cabmen who were in front of or near the 5th Avenue Hotel at time of explosion; when questioned about it they knew nothing. I was told a window of a car (red line), 23d street line, was broken, but I cannot ascertain anything definite.

I fail to find the name of party or parties reported so seriously injured, and, as for upsetting a cab in front of the 5th Avenue Hotel, it needs no investigation, for an examination of the condition of pavement after explosion shows the utter impossibility of the thing.

Mr. Ward, who was employed in laying the Johnstone system, tells me that the gas companies have been notified three or four times that a leak existed at 23d street. (Signed) C. W. PARISEN, Inspector.

MARCH 29TH, 1889.

The excavation made by the Gas Companies on the west side of 5th avenue and 23d street crossing have developed a network of gas pipes and a very gaseous condition of the earth in this neighborhood. On Tuesday, 23d inst., at 4.30 P. M., a leak was discovered in the Standard Gas Company's 10-inch gas main, caused by

carelessness in putting the plug into the dead end of the main; on taking hold of the plug it was found quite loose, and was readily set up by hand; a three-foot wrench was obtained and the plug screwed up. The leak from this plug was sufficient to make the neighborhood dangerous.

During the two days that the ground here was opened the smell of gas was convincing enough to show that the condition of the ground was no different here than in many other places of the city. This illuminating gas penetrates through the brick and cement work of the manholes in sufficient quantities to make the air in them dangerous; so that it is rarely safe for breathing where the manholes are built near the gas mains. There are many instances in the city where, on taking up the pavement and making a hole in the ground with a bar, only a few inches in depth, if a match is applied to this hole the gas will ignite and burn continuously. This I have personally tried at Broadway and 25th street, at 38th street, between Seventh and Eighth avenues, and at Sixth avenue and 42d street.

There are instances where, on examining gas pipes when they have been opened in the sides of the subway trenches, I have seen the men, while looking for leaks, thrust a knife blade through the blow holes of their cast iron pipes.

This illuminating gas penetrates into the sewers so that there are occasionally occurring explosions which the Department of Public Works may have some record of.

A lighted match or scrap of burning paper carelessly dropped into a sewer opening and igniting the gas therein is almost a monthly occurrence.

There was an explosion of the sewer in 42d street, near Sixth avenue, last January, where several manhole heads were blown up into the air; another explosion of the same kind at Third avenue and 101st street. Three other explosions took place in June last.

I instance three facts to show that the ground of this city is so thoroughly saturated with illuminating gas from defective mains that we are apt to ignore the important factor of the proper insulation and care of the cables in the subway, for the secondary one of protecting ourselves from the insinuating gas leaks, which endanger life from inhaling as well as from danger of explosion.

(Signed)

ROBERT WEIR, Prin. Asst. Engr.

Mr. Lauterbach, continuing: I have present one of our officers who was present at the time of the examination of the Standard Company's main in that neighborhood who can testify to it if it be necessary.

Mayor Grant: (Referring to papers from which Mr. Lauterbach had been reading). You will leave those papers on file.

Mayor Grant: Now let me ask a question. You say that the Standard Gas Company is doing the very best that it can in the way of testing pipes?

Mr. Lauterbach: We think its method of construction is probably as good as can be devised.

Mayor Grant: The natural consequence would be that the escape of gas comes from the pipes of the old companies.

Mr. Lauterbach: It comes from them in the majority of instances.

Mayor Grant: But you say that the Standard Company is doing the best that it can and the leak comes from the cap loose on its pipe?

Mr. Lauterbach: I am not complimenting them.

Mayor Grant: You are qualifying the entire argument. That is the worst escape that there has been?

Mr. Lauterbach: Yes, sir. This particular explosion has been, in our opinion, carelessness. The general explosions that have taken place have come from the cause of a defective condition in the mains.

Mayor Grant: It appears from your statement that the very worst explosion you have had has been where the greatest precaution was taken.

Mr. Lauterbach: The greatest precaution. They left the cap off. In all other cases I have spoken of, the conditions have been caused and the leakage has taken place from what I have demonstrated to be defective material. This whole subject is one than which none more serious can be presented for the consideration of the Board of Electrical Control or the Subway Company or the Gas Companies. It is one of paramount interest to us, is to you, and is undoubtedly to them. We have succeeded in the length of time we have been doing our business in putting down 300 miles of duct. I see by a statement in the "Sun" that there are no less than 1,080 miles of main of the gas companies in the City of New York. For me to criticise the actual condition of the whole 1,080 miles of main would perhaps be ridiculous. I merely make the suggestion that it will be conceded probably by the companies that some of the older mains and those that were not laid in the better methods are not in as good condition as if they had been laid in a more recent period. The control over the gas companies by the authorities is much less than the control of the authorities over us. They are more free agents than we are. To what extent any remedy can be had is also a question to be decided by the Board and the Counsel for the Board; but I believe that, if in this case a course is pursued similar to that which is pursued in the case of the Steam Heating Company, it may be fair to presume that every precaution will be taken by the gas companies to remove the difficulties which exist, not only in the instance of carelessness to which I have referred, but which, it seems to be natural to suppose, does exist from the condition of things throughout the city, and especially in the lower section of it. Mr. Beckwith is here. He can state what condition was developed while we were engaged in building the subways. But it is a question which ought to be met fairly. I think that the Engineers of the Department of Public Works, of the gas companies, our own engineers, and under the direction of the Board of Electrical Control, should be gathered together in conference upon these subjects, and that we should endeavor to do that which will remedy this trouble and prevent the recurrence of such explosions as these heretofore occurring.

Mayor Grant: I have called on the President of the Standard Gas Company and Presidents of other companies to be here. I would like to know what these gentlemen have to say on the subject.

John P. Kennedy, President of the Mutual Gas Light Company: Mr. Mayor and gentlemen, I was invited to attend here to-day at this meeting. I have heard the remarks made by Mr. Lauterbach, which are very exhaustive, but I must beg to take exception to some statements he has made, or rather, read from the report. The report states that the gas pipes were laid very carelessly; that they are inferior in quality, and that they are rotten. To those three statements I take very great exception, and I am prepared to prove that they are not so. When these gas pipes were made—for your information I will state—they were subjected to a hydraulic pressure of 300 pounds to the square inch. The gas companies, in laying these pipes, would be very remiss and very stupid if they laid them carelessly, because the profits of the Company are dependent upon the tightness of the pipes, and no man of common sense—

Mayor Grant: Are they laid by contract or by your own men?

Mr. Kennedy: I have laid some thousands of miles of pipe in my time. I have been a contractor and builder of gas works for nearly forty years, but I never allowed any contractor to lay my pipes. I have contracted to dig the trenches, but I invariably laid my own pipe.

Mayor Grant: Is it practical to make a test of the present pipes?

Mr. Kennedy: Not now, it is not. It would have to be done during the time they are laid.

Mayor Grant: You could not shut the gas off and test them now?

Mr. Kennedy: No, sir, it could not be done. From hearing what Mr. Lauterbach has read and said, you would imagine that it was possible to make a tight gas pipe; but it is a physical impossibility to make gas pipes tight and hold the gas in them—particularly with a cast iron pipe. It is not the illuminating gas, however, that escapes through the pipes.

Mayor Grant: You say it is impossible?

Mr. Kennedy: Yes, sir; I say that without fear of successful contradiction. It is patent the gas escapes through the joints of the pipes.

Commissioner Hess: You have a gas main on Sixth avenue?

Mr. Kennedy: Yes, I have a 24-inch gas main there, which was in a very dangerous position while this subway was being laid.

Commissioner Hess: When was that pipe laid?

Mr. Kennedy: That pipe was laid in 1871.

Commissioner Hess: A great deal of gas escaped the moment the earth was dug up?

Mr. Kennedy: It did not escape out of that pipe.

Commissioner Hess: The earth was permeated with gas.

Mayor Grant: What are the oldest pipes you have?

Mr. Kennedy: 1871 was the year I laid my pipe. I estimate the present leakage through the pipes to be in the neighborhood of five per cent.

Mayor Grant: Is there anything you can suggest to obviate this difficulty?

Mr. Kennedy: I think those manholes can be ventilated without any great expense. As a matter of course, it is something that has considerable theory, because I never had any experience in that line.

Mayor Grant: If the escape of gas is so great, as it is liable to cause an explosion in these manholes, why will it not cause an explosion in a cellar or vault? I think it is about time this subject was fairly gone into.

Mr. Kennedy: There is a wall intervening.

Mayor Grant: There is a wall intervening in the manholes. I only say what I have seen of the construction.

Mr. Kennedy: It is simply a brick wall laid in cement.

Mayor Grant: Why would it not protect also?

Mr. Kennedy: Because these manholes are green—have not had time to set yet.

Mayor Grant: I see. That one there had not set. How long is that built?

Engineer Kearny: It was built a year ago last July.

Mayor Grant: So you see it has had time to set; it is nearly two years old.

Mr. Kennedy: Not thoroughly, sir.

Mayor Grant: Hydraulic cement, I think, sets quicker than that?

Mr. Kennedy: But it gets more solid every year; the older it is the stronger it is.

Mayor Grant: This would apply to every new building that is built—you would say this explosion is liable to occur?

Mr. Kennedy: I am not prepared to admit that.

Mayor Grant: I don't think you are. The ventilation of these manholes is not going to be a sufficient solution of this difficulty.

Mr. Kennedy: I think it is, sir. I think if they are made right there will be no trouble whatever. If you will pardon me for a few moments I will explain to you. This subway is in close proximity to the gas pipes. The ground is not permeated for any great distance laterally from the pipes, because it has a tendency

to ascend and get up above, and there is just that strata above our gas pipes that is permeated with this gas. If you go under five or six feet, you don't see anything of the kind; the gas don't permeate laterally—it permeates perpendicularly, and seeks an outlet at the pavement.

Mayor Grant: The Commissioner of Public Works would like to know how it gets in the sewers?

Mr. Kennedy: Is not that gas generated in the sewers?

Commissioner of Public Works D. Lowber Smith: No, sir; it is illuminating gas. I think it will permeate in that direction.

Mr. Kennedy: I think there is a great deal of gas accumulated in the sewers. I think if you will make an excavation a reasonable distance from the sewers you will find there is no gas there.

Mayor Grant: The Commissioner's experience has been to the contrary.

Mr. Kennedy: I don't think you will find, if you make an excavation in the earth a few feet from the line of the main, that you will find any gas permeated there.

Commissioner Smith: I am inclined to differ with you.

Mr. Kennedy: I claim that this gas which permeates the ground around our mains does not go into the houses.

Mayor Grant: I have understood that it did.

Mr. Kennedy: I think it can be shown—I think there is a simpler way of ventilating those manholes than using the blower.

Mayor Grant: What is it, Mr. Kennedy?

Mr. Kennedy: It is—of course, I have never made any experiment—I give it as a matter of my judgment and experience as a gas man—I think if there were two pipes put into each of those manholes, starting so from behind the curbstone on the sidewalk, and one of them going in under the lower cover—there are two covers on these manholes—going right under the cover, as close as convenient, and terminating behind the curbstone at the edge of the sidewalk, just turning the top of it the same as they do sewer pipes on the top of houses. That is for the outlet. Now, then, another one alongside of it that would go down to the bottom of the manhole and carry in the air. And then, in addition to that, I would have each manhole thoroughly covered with asphalt, not put on with a brush, but put on with plaster, the same as they fix damp cellars. Do that thoroughly and close it around these pipes that come through the brick wall on their sides, make it thoroughly tight, and I believe that any gas that would get in there would walk right out. I do not claim this as a certainty, but, if I were the Engineer of the Subway Commission, that is the way I would fix it.

Commissioner Hess: Where would you place those vent holes?

Mr. Kennedy: Behind the curb, on the sidewalk. You must have both an inlet and outlet to give ventilation, and heavier air will go to the bottom and force the light air out at the top. As I understand it, these pipes that carry the cables, the joints are made thoroughly gas tight; if this is the case, no gas can get in there.

Mayor Grant: What does the Engineer, Mr. Beckwith, think about that?

Leonard F. Beckwith, Engineer of the Consolidated Telegraph and Electrical Subway Company: I would like to mention this, that we do not think the gas gets into the pipes between two manholes on account of the construction of the pipes—they are so tight. At the manhole it comes in in two different places; no one can tell which; in the one case it infiltrates through the masonry; in the other, it comes in through the small cracks which exist between the casting—frame of cast iron which rests upon the masonry of the manhole. The bearing of the trucks on the edge of the casing disturbs it, and a different expansion is cast upon it, and the brickwork upon which it rests gradually makes that fill with small cracks, and the gas gets through there. Mr. Kennedy's idea, I consider, would be a very imperfect remedy, because it would not affect that joint materially. It might improve the masonry itself. Now, on the other hand, with regard to the remedy proposed of putting pipes there, one upper pipe and another pipe, in order to produce a current of air, the gas coming out of the upper pipe would be liable to explosion from incidental causes, leaving aside any maliciousness or mischievousness that might arise from throwing away a match or a cigar or any lighted material, and that explosion would go backward, down, and ignite the gas in the manhole. When you think four per cent. is sufficient, even if that made a partial ventilation, there would be enough to ignite if the explosion ignited at the surface—four per cent. of illuminating gas in 100 per cent. of air and gas.

Mayor Grant: 96 per cent. of air and 4 per cent. of gas?

Mr. Beckwith: 12 per cent. is admitted to be the worst mixture. In speaking of these surface vents, whether in the shape of pipes to the sidewalk which may be ignited in this way, or whether it is through vents to the street through the covers of the manholes, the same reason applies. We have been prevented from putting in vents from what has occurred. There are instances on record in Chicago and other places where gas exuding through that loose cover or through that hole has been ignited backward with very bad results. I know of one instance, of which a party told me, where a fire engine, going to a fire, passing over a sewer, the jar was sufficient to empty some live coals, the gas coming up through the sewer ignited, and went backward into the manhole, exploding there, tearing off the cover and turning the engine on its side.

Mr. Kennedy: But we did not suggest ventilating through the manhole cover.

Mr. Beckwith: No, sir.

Mr. Kennedy: That don't apply to this at all.

Mayor Grant: Mr. Beckwith don't agree with you in that regard.

Henry S. Kearny, Engineer of the Board: I think Mr. Kennedy's statement is more than answered. Sewers have all the ventilation that is desired, the manholes being perforated with air holes, and water running through them, causing a draught of air; still sewers explode with all that current of air running through them.

Commissioner Gibbens: Can pipes become rotten?

Mr. Kearny: They do become rotten.

Commissioner Gibbens: Apart from the pressure of salt water?

Mr. Kearny: I simply say that a good deal of the gas pipe we took up in Sixth avenue was absolutely rotten.

Commissioner Gibbens: State exactly what condition that pipe was in and what the gas company did about replacing it?

Mr. Kearny: There was a good deal of that pipe. The Consolidated Gaslight Company has four lines of pipe on Sixth avenue, between 23d and 33d streets; when we laid our subway there we were obliged to take up two lines of pipe; a very large proportion of that pipe looked to me to be in such an inferior condition that it would not do to go in the ground; we put new pipe in the ground at the suggestion of the Consolidated Company.

Mr. Kennedy: My pipes are not in the Consolidated Company.

Mr. Kearny: The Construction Company paid for it.

Mr. Kennedy: I cannot answer for the Consolidated Company's pipes.

Commissioner Gibbens: I would like to ask Mr. Kearny whether it is possible for gas to go in a house from the street through the brick masonry.

Mr. Kearny: Certainly; Mr. Kennedy will admit that the gas can permeate through the vault.

Mayor Grant: What do you think, Mr. Kennedy, about the theory in that report—that the escape was made in the cellar of the Fifth Avenue Hotel, and from there became ignited, and the explosion took place?

Mr. Kennedy: I think that more of a theory.

Mr. Kearny: I found out from the Novelty Company people that on Sunday—this explosion occurred on Monday morning—the porters and men who have that in charge in the Fifth Avenue Hotel were looking through the cellar; they could smell the gas through the house; they looked everywhere through the cellar for this leak; in their search they went to the door of the Novelty Company's cellar; not being able to get in, they broke open, or in some way opened the transom window between the show window and the sidewalk, and discovered a very strong odor of gas coming out of the cellar.

Mr. Kennedy: Did that not go in through your tube?

Mr. Kearny: I imagine it did go in through there.

Commissioner Gibbens: How about the gas in the basement of the Fifth Avenue Hotel?

Mr. Kearny: The Novelty Company occupies a store of the Fifth Avenue Hotel.

Mayor Grant: Who occupies the basement?

Mr. Kearny: The Novelty Company occupies a part of the basement.

Mr. Kennedy: As a matter of course, the gas would get through a pipe in that way.

Commissioner Gibbens: Col. Kearny, you have not answered my question. Is it possible for gas in the street to get in a house? or does it go up straight, as Mr. Kennedy suggests?

Mr. Kearny: It is possible to go through the vault. I attribute the escape of gas into houses in this way: One company has a main in the street, and it put in a service pipe, and a competing company comes, and it has a service pipe to its main; these service pipes deteriorate much faster than the mains; I think most of the leaks in the houses come from these service pipes rotting out and carrying the leak in the houses; we found substantially along Sixth avenue, that to every house along there there were from two to four service pipes, showing that as the new companies came along the old service pipes were left there.

Mayor Grant: Is it possible to make a gas pipe tight?

Mr. Kearny: I think Mr. Kennedy admits that. I suppose it could be coated with asphalt. Will you admit that, Mr. Kennedy?

Mr. Kennedy: No, sir.

Mr. Kearny: If it could make masonry tight, it would.

Mayor Grant: It could not be made tight?

Mr. Kearny: Not absolutely tight; no, sir.

Mayor Grant: It cannot?

Mr. Kearny: As well as you can make masonry tight.

Mr. Kennedy: It is a different affair altogether; you can get at the masonry to do it, but you cannot get at the pipes.

Mr. Lauterbach: One question as to wrought iron pipe?

Mayor Grant: What sort of pipes do you use?

Mr. Kennedy: We have used cast iron.

Mayor Grant: Do you think wrought iron pipe would do any better?

Mr. Kennedy: I should think wrought iron pipes would be better because it has a

closer fibre; but this is a recent affair, this wrought iron business; we have not tested it yet; I do not know why that won't leak at the joints just the same as ours.

Mayor Grant: Do you claim all the leak is at the joints?

Mr. Kennedy: Most of it is.

Mayor Grant: Do you claim it all is?

Mr. Kennedy: No, sir; I think there is a leakage through the pipes of hydrogen gas; the chemists will tell you that it is almost impossible to hold it, and our pipes have a certain amount of that in it almost necessarily; and that is the gas that comes through our pipes; but, with all due deference to Mr. Beckwith, I think that my plan of ventilating the manholes will do the business. It is a matter of experiment; you can take a vessel and try to see whether it can ventilate; I believe the heavy air getting down to the bottom will fill the manhole and send all out; and, as to the matter of explosion, Mr. Beckwith, that is very easily remedied by putting the gas on and then it cannot explode. Is that all?

Mayor Grant: That is all unless you can suggest something. You know the purpose of this meeting. I want to say that I have no other purpose than the prevention of these explosions and the obviating of this great difficulty; and we hope that the gas companies will endeavor to do something to help us out in this. I cannot say—

Mr. Kennedy: If you ventilate these manholes—

Mayor Grant: These two Engineers don't seem to agree with you, Mr. Kennedy?

Mr. Kennedy: They are like the Doctors—they never agree.

Mayor Grant: Have you any Engineers that think this can be done?

Mr. Kennedy: I am the Engineer and Superintendent of my Company.

Mayor Grant: I understand that, Mr. Kennedy. We might get expert testimony to try this.

Mr. Kennedy: I think the better way is for Mr. Beckwith to try this device; I suggest that he do it within an iron vessel and see whether it displaces it or not; I believe it will do it thoroughly.

Commissioner Gibbens: Do you think the gas companies ought to be allowed to be wholly responsible for the escape of the gas, and the Construction Company building subways ought to take care of it?

Mr. Kennedy: Certainly I do. There is no confession. It is a matter of fact. You may be aware, Mr. Gibbens, we have rights in the city, and we pay taxes, and have always paid taxes on our pipes, just the same as you pay taxes on your house, and we have the right to possession just the same as anyone else.

Commissioner Gibbens: And the right to leakage?

Mr. Kennedy: That is something that cannot be avoided; there is no city in the world that don't leak just the same as New York does—not one.

Commissioner Gibbens: I was going to say, Mr. Mayor, I have an engagement this afternoon at half past two, and inasmuch as there is a great deal of this, and inasmuch before coming to a decision we ought to have all the testimony and advice possible, and some of the gentlemen are not here to-day, I suggest that we take a recess until to-morrow at one o'clock P. M.

E. J. Enfer, of the Equitable Gaslight Company: I heard the few remarks that have been made by Mr. Gibbens. We have remained in the ground only for five years, but I can prove that since the Subway Commission have commenced to lay their subway our leakage has increased, owing to the very bad manner in which the ground has been excavated and the mains exposed; it is impossible in this case to avoid leakage; no matter how much precaution we may take to avoid leakage; I know of cases where the subway is laid in so close proximity to the gas main that it is impossible to get at the main without destroying the subway, places where the manholes are built right on top of twelve-inch mains; we have tried to avoid those things; we have remonstrated several times, but it has been to no effect.

Mayor Grant: It is evident we are not able to come to any agreement to-day. We must do something; I guess you will admit that; and, to do that, it is only the intention of the Board to do the very best it can.

The Board then adjourned to Tuesday, April 2d, 1889, at one o'clock P. M.

Minutes of a Special Meeting of the Board of Electrical Control (adjourned from April 1st, 1889), held at the office of the Mayor, in the City of New York, on Tuesday, April 2d, 1889, at 1 o'clock P. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

Commissioner Gibbens: Mr. President, I would like to ask Mr. Wheeler some questions upon this subject.

The President: Mr. Wheeler, Commissioner Gibbens requests permission to ask you some questions, unless there is some objection by the Board, I certainly have none.

Commissioner Gibbens: I read an account of this matter in a paper this morning which stated that the Secretary of the Edison Electric Light Company had said that the leakage of gas in the street had never destroyed any of the Edison boxes. You have been superintendent of the boxes of the Edison Company in this city, and you know something about them. I would like to have you tell us what you know on that subject.

Mr. Wheeler: Yes, sir, I have laid some of the Edison conductors, and I have had some of the cast iron boxes that they use as manholes under my charge. I have known of one or two of them blowing up from the gas in them being exploded by an electric current. When this gas was exploded it blew the cover of the manhole up high enough so that when it came down it landed on the top of a house.

Commissioner Gibbens: That was not serious at all?

Mr. Wheeler: Not at all. In going up, the cover had to strip the thread off the six bolts.

The President: Do you mean to say it blew from the street up to the top of the house?

Mr. Wheeler: Yes, sir; it blew from the street and landed on top of the house.

Commissioner Gibbens: One of the reports of the meeting of yesterday stated, or it was stated editorially in the paper, that the Edison boxes had never exploded. This statement was made in the attempt to show that the subway boxes were bad. Mr. Wheeler states that there have been explosions in the Edison boxes, by the side of which ours is a mere pigmy.

Mr. Wheeler: This occurred on the corner of Maiden Lane and Nassau street. The box is very small compared with our large manholes. The cover is not more than about a foot in diameter.

Commissioner Hess: It is very little?

Mr. Wheeler: Very little, compared with the cover on our boxes. It is held down by six bolts. There is a nut fastened down on what a machinist would call a stud. When this gas was exploded, it stripped the nuts off and blew the lid up, the neck of the box acting very much like the muzzle of a gun, giving it direction. It travelled right up in the air.

Commissioner Gibbens: Like a loaded mortar?

Mr. Wheeler: Yes, sir; like a loaded mortar.

Commissioner Gibbens: Do you know of your own knowledge of any gas pipes, or have you ever seen any gas pipes, which appeared to you to be rotten in localities in the city where there was no salt water?

Mr. Wheeler: Yes, sir; I think so. I have, in laying conductors for the Edison Company, dug up gas pipes in Pearl street. I do not think there was any salt water there near the surface.

The President: Whereabouts in Pearl street?

Mr. Wheeler: Near Fulton street. I remember distinctly once having uncovered the gas main, which was small—between six and twelve inches in diameter; I do not remember distinctly the size—which had a crack in it, so that when the earth was removed the pipes separated, the crack opening and allowing a very large escape of gas. I remember trying to stop the escape by wrapping some rope around the pipe at that point, and covering it with putty or something of that sort. We notified the gas company of it, and they came along and repaired it. They said it was not a very unusual thing. My recollection is, from the remarks of all the men who were present, that the gas companies were in the habit of having serious leaks like that, and that they did not pay any particular attention to them until they were located or unearthed by somebody else; and then, of course, they would take measures to repair them.

Commissioner Gibbens: Let me ask you how you regard the statement which was made here yesterday by a gentleman representing a gas company, to the effect that the leaking gas naturally escapes immediately upward through the paving stones?

Mr. Wheeler: I think that is a question entirely of degree. Of course, the gas will escape upwards a little more readily than it will sideways, because the tendency is to rise. Besides that, from the very fact that the pipe has been laid, the earth above it has been disturbed and has not been put down quite as tightly as the original condition of the earth, so that there is a little better chance for the gas to escape upwards. But I think there is also an escape sideways to some little degree.

Commissioner Gibbens: What do you think would be the result of an escape of gas in the street, for instance, where the pavement was asphalt? Would it escape upwards through the asphalt?

Mr. Wheeler: I do not know. I should like to ask the Engineer of the Board about the porosity of asphalt before answering that question. If it would not get through the asphalt, that would not alter the fact as to the escape of gas through the earth until it struck that asphalt. If the asphalt was not porous the gas would spread out sideways and travel along under the surface until it found an opportunity for escape.

Mr. D. Lowber Smith (Commissioner of Public Works): There are six inches of concrete under the asphalt.

Mr. Wheeler: The fact that asphalt and concrete are there does not stop the gas getting out of the pipe. It will come out, and it will simply travel around until it finds an escape.

Commissioner Gibbens: The upshot of your opinion upon the subject is that gas naturally travels in the direction of the least resistance?

Mr. Wheeler: Certainly, it naturally travels in the direction of the least resistance. That is all there is of it. Gas is forced through the pipes under a pressure of about a quarter of a pound, I believe. Of course, when it has an opportunity to get out of the pipe it will do so, and if the earth is very loose above the pipe the gas will travel upwards; if not, and there is a chance for it to escape downwards, of course the pressure of a quarter of a pound is sufficient to force it in almost any direction.

Commissioner Gibbens: I would like to ask some questions of Mr. Jackson, whose name has been given to us. He understands the subject, and can give us a description of the manner in which natural gas is conveyed in Pittsburg. He represents the Westinghouse Company.

The President: Mr. Jackson, Mr. Gibbens wishes to ask you some questions. He says you represent the Westinghouse Company?

Mr C. H. Jackson: Yes, sir; to a certain extent.

Commissioner Gibbens: I would like to have you make a statement to the Board

of your experience in carrying natural gas in Pittsburg. I understand that that gas is much more volatile than the illuminating gas used in New York, and that it is much more explosive, and is carried under a greater pressure.

Mr. Jackson: Yes, sir; those are the facts. It is more volatile. We carry it at a pressure varying from ten to fifteen pounds to the square inch, through the streets. We found considerable difficulty in managing that business when we first started in Pittsburg, owing to the leakage from our pipes, and the consequent explosion of our manholes, and also to its getting into the cellars of the houses, and so on, which, of course, caused us considerable trouble. We blew up three sections, with three or four houses in each section, from the gas percolating through the earth. However, the house explosions were invariably in the winter season, when the surface of the ground was frozen. The gas has a tendency, as Mr. Wheeler has stated, to go up so long as the earth is not frozen; but when you have a frozen crust there is no other way for it to go than to percolate sideways; and, of course, it gets into the sewers and from the sewers back into the houses, and so on.

After having three or four experiences of that nature, we thought it was probably more prudent on our part to save some expense and stop that leaking; and so we set ourselves about it.

Commissioner Gibbens: Did you find that you could stop the leakage of this very volatile gas?

Mr. Jackson: We did. We have not had an explosion of gas for the last eighteen months or two years, and we carry several hundred thousand feet a day.

The President: How did you overcome that difficulty?

Mr. Jackson: At each joint of the pipe we put on what is called a globe joint, which is caulked with lead the same as the bell joint of a cast iron pipe. That prevented further leakage. Then we also connected several of these globe joints together by an auxiliary pipe, an inch and a half or two inches in diameter, so that if there was any leakage around the joint of the main pipe it would be carried off into the inch and a half or two-inch pipe.

The President: Did this auxiliary pipe continue the entire length of the other pipe?

Mr. Jackson: No, sir; that was just at the joint. We finally settled upon that. When we first began the natural gas business, we put in what we call a telescope pipe—one pipe inside of the other.

Com'r Gibbens: That was the first step?

Mr. Jackson: The inside pipe carrying our high pressure gases, which we carried through the city at a pressure of 15 to 20 pounds to the square inch; then allowing it to leak into the outside pipe, from which we supplied the mills and houses. It made very little difference, but we had regulating valves to regulate the pressure at different points along the line. That plan was finally abandoned, and we adopted this other plan of putting a globe joint at each joint of the pipe.

The President: Which obviated the double pipe?

Mr. Jackson: Which obviated the double pipe. Then these globe joints were connected together from street corner to street corner by a small auxiliary pipe, as I have explained, of an inch and a half or two inches in diameter, which, at each street corner or every two street corners——

Com'r Gibbens: Will you make a diagram to show that? I want to see what relative proportion the small pipe bore to the large pipe, so that I may get some idea of it.

Mr. Jackson (after making a sketch): I am not a very good expert draughtsman. The mains vary in size.

The President: How big was your auxiliary pipe?

Mr. Jackson: About an inch and a half.

The President: Was it just an ordinary pipe?

Mr. Jackson: Just an ordinary small pipe. Taking that (illustrating by his sketch) as an ordinary pipe, it would be caulked here. We would put on at that point another pipe. It would be something like this. That would come down pretty close here. It would be caulked here and here; and, of course, that would extend all the way around the pipe. There would be tapped in here a little nipple, which tapped into a small pipe about an inch and a half in diameter.

The President: That ran the entire length of the pipe, like the escape of a steam engine?

Mr. Jackson: Yes, sir; it ran the entire length like the escape of a steam engine. We carried that at intervals of, say every square or two square or five squares to a post at the street corner; and if there was any opportunity of escape at any one of our joints we could discover it by our linemen lighting this escape from time to time. He could then determine where the escape was; and if it was very large, and sufficient to warrant our taking up the joint and repacking it, we did so. For more than two years past we have not had an explosion in the city of Pittsburg. Prior to our taking this precaution, however, we were continually harassed with such things.

Commissioner Gibbens: It has been stated to the Board that it was impossible to make gas pipes tight. What do you think of that statement? What sort of pipes do you use?

Mr. Jackson: We use both the wrought iron and the cast iron pipes. We use auxiliary joints on both. While it is not impossible, perhaps, to make a gas pipe tight, it is a pretty difficult matter. I will admit that it is a pretty difficult matter to have every joint tight. Although they may be tight when you first put the pipes down, there may be certain settlements of the earth and causes of that nature which produce leaks. But with these auxiliary joints we have never had any trouble. That is really the way we hold our gas.

Com'r Gibbens: You do not imagine, then, that the gas goes through the iron pipe?

Mr. Jackson: No, sir. That is, it is almost imperceptible.

The President: Especially with wrought iron?

Mr. Jackson: Especially in the case of wrought iron. We have not been troubled in that regard at all. At the ordinary pressure of gas it would not percolate through cast iron or wrought iron either.

Commissioner Hess: The pressure you had was much more than that used in the gas mains of this city?

Mr. Jackson: Yes, sir; 15 pounds as against four ounces carried in the city, usually.

Com'r Gibbens: There is a man here who was present at the 23d street explosion. That is to say, he was on the ground when the gas company repaired its leak the next day after the explosion. I would like to ask him a question.

The President: What is his name?

Mr. Beckwith: Frank Horne.

The President: Where do you live?

Mr. Horne: Jackson street.

The President: What number?

Mr. Horne: 51.

Com'r Gibbens: You saw the gas company repair its mains at this point?

Mr. Horne: Yes, sir.

Com'r Gibbens: Will you describe the condition of the pipe at the time you saw it?

Mr. Horne: It was a ten-inch pipe, with a ten-inch plug in the end of it, and the plug was just caught. When they discovered it, the man screwed it up half a dozen times by hand. Then they got tongs and screwed it up tighter.

Com'r Moss: Do you say they screwed it in by hand?

Mr. Horne: Yes, sir.

Com'r Gibbens: Did you understand there was another leak from gas pipes in that locality?

Mr. Horne: Yes, sir.

Com'r Gibbens: Where was that leak?

Mr. Horne: That was farther east, about fifty feet.

Com'r Gibbens: Was that leak discovered by the workmen of the Standard Company?

Mr. Horne: No, sir; the leak was there, but it was not in their pipe.

Com'r Gibbens: But they knew it was there? They discovered, on account of their excavation, that it was there?

Mr. Horne: Yes, sir; they could smell it.

Com'r Gibbens: They did not fix that leak?

Mr. Horne: No, sir; that was not in their pipe. It was in the pipe of some other company. They did not know whose pipes they were.

Com'r Gibbens: So far as you know, that other leak still continues there?

Mr. Horne: Yes, sir.

The President: What is your business?

Mr. Horne: I work on the subway; in the manhole.

The President: In what capacity?

Mr. Horne: Taking care of them; keeping them clean.

The President: You are in the employ of whom?

Mr. Horne: The Phoenix Construction Company.

Com'r Gibbens: This is the man who takes care of the subway manholes.

The President: It was your business to inquire into this explosion?

Mr. Horne: I was sent there to watch.

The President: Is there any representative of the Standard Company here? I understood General Spinola was to be here. Mr. Gibbens would like to ask a question.

Com'r Gibbens: Is Mr. Andrews here?

Mr. Wallace C. Andrews (President of the New York Steam Heating Company, and of the Standard Gas Company): I will be pleased to answer any questions.

Com'r Gibbens: On a previous occasion you came before the Board of Electrical Control, and stated to it that the leaks in the Steam Heating Company's pipes were something that you proposed to take care of; that you were doing your best to get them in order. You have since then been repairing them, and you have benefited the condition of the subways by repairing those leaks, I am told.

Mr. Andrews: Yes, sir.

Com'r Gibbens: We were told here yesterday by a representative of a gas company that his theory was that the gas company was not under any responsibility to keep its gas in its pipes (and I presume that the same application might be made to the Steam Heating Company), but, on the contrary, if it got out of the pipes, inasmuch as the gas company had certain privileges in the streets, one of which was to leak, the people whose property it came in contact with must take care of it. Is that your theory?

Mr. Andrews: No, sir. I wish to say that I heard that conversation yesterday. You refer to Mr. Kennedy. I cannot believe that Mr. Kennedy was at all serious

in that. The Steam Heating Company has two systems of steam distribution now at work in the City of New York. The first system, erected in the lower part of the city, was attended with a great many difficulties because the streets are very full of pipes here, and our engineer made a blunder in reference to the supporting of his pipes. I refer to the use simply of a wooden wedge, as I explained, instead of a cast iron wedge. That has caused all our leakages, so far as we can ascertain. It is a matter of no consequence in the point of economy. There is no desire on our part to economize. Our mains are enormously expensive. They cost \$100,000 a mile to put down the pipes in Broadway.

The President: You are talking now about the Steam Company?

Mr. Andrews: Yes, sir. We have remedied this defect in the foundation. It is nothing else. Our pipes are abundantly strong. They are wrought iron pipes. So that I wish to state that there has never been in the history of our business, for seven years now, an explosion of a steam pipe in the streets. Not one. There is a public impression that there have been explosions, but it is not true. There were explosions in the system of another company, the American Company, which has now gone out of existence. The manholes blew up; but those were gas explosions. They were not steam explosions. There is nothing about a steam pipe to explode, any more than there is about a Croton water pipe. I know what I am saying, and I hold myself responsible for that assertion. One is just as impossible as the other. And the reason is apparent. The steam has exploded, if you wish to use that term, before it has left the boiler house. In other words, the water has expanded seventeen hundred times in volume. There is no fire in the pipes, or under the pipes, and, there being no fire under the pipes, it cannot take up any energy. Having exploded before it left the boiler station, all that can occur is that it can leak, just as a Croton water or a gas pipe can leak. But it is simply a leak, and nothing more. Hence there has never been any such thing as a steam explosion, but it is a public error. We have no manhole system; but wherever a manhole exists there is danger of a leak and there is danger of an explosion. Not necessarily by electric wires, for five years ago these explosions were numerous with this other company, before there was any subway. How do they occur? The spark from the shoe of a horse or the stub of a cigar may be the cause.

Com'r Gibbens: Do you think it possible to keep the gas confined in the pipe?

Mr. Andrews: I do.

Com'r Gibbens: Does not your Company take measures to keep the gas in the pipes?

Mr. Andrews: I believe our lines are tight.

Com'r Gibbens: You do not believe that you would be thoroughly irresponsible for any leaking that might occur from your pipe?

Mr. Andrews: Not at all.

Com'r Gibbens: Do you test your pipes?

Mr. Andrews: Yes, sir.

Com'r Gibbens: You use the best pipes you can get?

Mr. Andrews: We use wrought iron pipes. The specification of weight per foot and so on for the pipes of the Standard Company was taken from the Standard Oil Company's books, describing a special pipe made to cross the Allegheny Mountains, which had a pressure of 1,300 pounds to the square inch. That pipe has been there for ten years. Our pipes are made under that specification. They are tested at the works under a pressure of a thousand pounds. They are again tested in the streets, when we screw them together, with a pressure of eighty pounds to the square inch.

Com'r Gibbens: Do you believe that it is utterly impossible to test a gas pipe after it is laid?

Mr. Andrews: I do not think you can put pressure on a cast iron pipe. I am speaking about wrought iron pipe. Of course, this is an entirely new thing.

But there is always an element of danger, as you see, in any receptacle in a street that may become filled with gas. I wish to say further that if every gas pipe in New York City were perfectly tight at this moment, if these manholes are not ventilated, there would probably be explosions for months to come, and will be even for years to come, from the simple fact that the soil is saturated with gas, and there would be enough of it to escape and get into the manholes to make an explosive mixture of air and gas. That would be due to the amount of gas that is now in the soil, which is the accumulation of years.

Com'r D. Lowber Smith: Your pressure is about seventy pounds in the steam pipes, is it not?

Mr. Andrews: We carry about eighty to eighty-five pounds.

Com'r D. Lowber Smith: That is about four times as much as the pressure of Croton water?

Mr. Andrews: I think there is a pressure in the Croton water pipes in some places much higher.

Com'r D. Lowber Smith: We can get about nine pounds—

Mr. Andrews: Have you not a pressure of over a hundred?

Com'r D. Lowber Smith: In the case of the high service pipes.

Mr. Andrews: I am speaking in broad terms. A leak of Croton water or a leak of steam is one thing. An explosion is distinctly another thing. A manhole filled with gas is much more dangerous than with a keg of powder with the lid off, for the keg of powder may remain where it is for years in the manhole and never explode. There may be sparks around, but if the sparks do not come in actual contact with the powder it may never explode. A manhole filled with gas is more dangerous, for the gas rises to the surface and is escaping there; and we all know by actual experience the danger from a spark from a horse's hoof or from a lighted stub of a cigar. In the

case of the explosion at Maiden Lane and Broadway of the manhole, the men of the gas company were looking for a leak two hundred feet away; and they put a torch down and it exploded the gas, and it lifted the manholes in John street half a mile away.

Com'r Gibbens: I would like to ask you, as a representative of the Standard Gas Company, and doing a sort of quasi public business here in New York, whether you would say to your superintendent, for instance, that he had better instruct his men when he found a leak in the pipe of another company to cover it up and not to make a statement of that fact to the authorities or to that other company?

Mr. Andrews: No, I do not think that is right to the public, nor do I think it is proper and courteous to the other company. Anything that is in fault ought to be remedied; and it is the duty of every one, whether an employee of our company or a simple citizen, to make these things known. There is no question about that.

Com'r Gibbens: Do you not think you ought to instruct your men upon that point, so that they will not do so again? We have heard evidence that they did do that thing. They fixed their leak at 23d street, and, while doing so, they found another, and they said that was no business of theirs.

Mr. Andrews: With regard to the leak spoken of at 23d street of the Standard Company's pipes, I think our contractor was at fault in not screwing the cap on as tightly as it could be screwed; but I have had no idea that that had anything to do with this explosion. It was very remote from the explosion. It is limited in amount. The cap was screwed on five threads. From the fact that manholes do fill continually with gas, both uptown and downtown, and everywhere, and that the soil is saturated with it, I do not think that leak had anything to do with the explosion at all.

Com'r Hess: Do you not know that this manhole was open three hours before the explosion took place, and they were cleaning it out?

Mr. Andrews: Yes, sir.

Com'r Hess: Do you think the settlement of gases in the earth, and the accumulation of these gases would cause them to fill this manhole so rapidly as to produce this explosion?

Mr. Andrews: Yes, sir. Bear in mind that the manhole is full of air, for there is no vacuum. It only needs a small admixture of gas to make an explosion possible. The gas engine explodes on about fourteen parts, and as it only needs one part of gas to nine of air, it would take but little gas to get into the manhole to make an explosion. That might occur in ten minutes from any small leak in the vicinity.

Com'r Gibbens: I would like to ask you whether it is not the fact with most of the gas companies of New York that there are not a number of mains along the same streets?

Mr. Andrews: Usually there is a gas pipe in each side of the street.

Com'r Gibbens: Not more than that?

Mr. Andrews: Usually not more than one, I think. There may be a feed pipe in addition; but, I think, probably no one company would have more than one pipe on each side of the street.

Com'r Hess: Do you not think there is a main on each side in Broadway, and then there is a trunk line or larger main also in the middle of the street?

Mr. Andrews: We have a ten-inch main on each side of the street in 23d street. Will you allow me to suggest a remedy? Inasmuch as these manholes are built, I know not what I should do. I should go right through them and drill five-eighths or three-quarter-inch holes in them and let the air in. That is the correct way of doing that. If that would not produce the remedy I would pump air in.

The President: We asked Mr. Beckwith about that yesterday, and he did not think that would do any good. Mr. Beckwith, Mr. Andrews, says he would recommend holes being made in these manholes. What have you to say about that?

Mr. Beckwith: At what point?

Mr. Andrews: I should perforate the lid itself with these holes. That would be sufficient, and would avoid danger from sparks made by horses' hoofs. I know this: that the American Steam Company—I am going back to actual experience——

The President: One question. Will you hear what Mr. Beckwith has to say about that?

Mr. Beckwith: Your Honor, I explained yesterday that the drilling of holes in the covers would create a new source of danger in causing explosions. Explosions have occurred in New York and elsewhere from gas exuding around the lid of the cover, which was loose, and it would be true if such holes were bored through the covers. The gas would be set fire to by accidental causes, like the spark from a horse's hoof, or a lighted coal being dropped from an engine, or some such accidental cause as the throwing of matches or cigar stubs. The gas which is exuding in this manner would become ignited, and the train would go back into the manhole. While this method might avoid some explosion, it would bring into possibility other explosions. That is why we made the manhole covers as tight as they could be made. They are made to-day as tight as they can be with double covers.

The President: What do you think of that, Mr. Andrews?

Mr. Andrews: I admit that if the manholes can be made tight, and kept tight, that would be the better form; but here comes in the question of the difference in temperature and expansion. For instance, we will take a summer's day. The accumulation of heat is so very considerable on those iron plates that they will expand, while in cold weather they will contract. Mr. Beckwith himself evidently leaves room for expansion in his manhole lids. Having left that room for expansion, what would be the effect on a winter's day? There comes in the element of contraction. Has it, or not, contracted sufficiently to cause a leak?

Mr. Beckwith: Ample provision in the rubber gasket is made for expansion.

There is leakage, and that we find impossible to stop, especially in the masonry of the manhole, and possibly in the joint of the cement upon which the cast iron frame rests. It is there that gas gets in.

The President: You do not think that the suggestion of Mr. Andrews, that ventilation should be made by perforating the top of these manholes, would be a sufficient relief or any relief as to this difficulty? Is that it?

Mr. Beckwith: No, sir; I would not recommend it. I think the danger is more than off-set by any advantage we could get from it. I think Mr. Andrews does not understand the construction of our manhole cover.

Mr. Andrews: I did not speak of that as being an effective remedy. I only made that as a suggestion because of its having been done with the American Steam Company, and it seemed to answer the purpose at that time, although their manhole cover may have been different. I think the remedy would be in additional ventilation, and I presume that must be accomplished by pumping air in.

Mr. Kearny: Possibly Mr. Andrews does not know that we have a large pump?

Mr. Andrews: I think if you get enough air in it would be found to be a remedy.

Com'r Gibbens: That does not remedy the matter so far as the escape of gas in the streets from the pipes is concerned, because it gets right into the houses, and there is a liability of explosion in the cellars and sewers.

Mr. Andrews: There is nothing new about that. Gas will explode; and it is one of the things that are incidental to our city life. I speak of it as an existing fact. There is no use in ignoring it.

Com'r Gibbens: Is it a fact that gas pipes cannot be made sufficiently tight?

Mr. Andrews: I have answered that. I believe they can be.

Mr. Beckwith: Before this particular question is finished, will you permit me to say something in reference to the ventilation of manholes. At several points in the subway, where the cables run to the roofs of the building, they run through a three-inch iron pipe, where it is carried through the ground in front of the building and then carried to the top of it. In all of those cases those pipes do, as far as we can find out, help the ventilation. It was suggested by Mr. Kennedy yesterday that if two pipes were laid to the curb that would help to ventilate the manholes. I disagree with him on that point, and, I think, it adds a new source of danger. If the Board of Electrical Control would allow the subway company, upon some line of subway where ventilation is not systematically in operation, to carry a pipe from a part of the manhole to the curb, and carry another pipe to the top of the city lamp or electric light pole, that would very materially assist in ventilating, to a moderate degree, that manhole, or would tend to diminish the evil.

The President: You want to try an experiment on it, do you?

Mr. Beckwith: I should recommend that that should be tried.

Com'r Gibbens: To ventilate your manhole in that way would do away with your ventilating with these blowing machines.

Mr. Beckwith: That is the reason I suggested that it should be tried on some line where the blowing apparatus is not in existence.

The President: You think that suggestion is worth while testing?

Mr. Beckwith: I believe if we can have a difference of level established by running the exit pipe to a sufficient height it might accomplish something. You cannot do that on the fronts of buildings.

The President: If that is your opinion, of course I cannot see any objection to it.

Mr. Beckwith: It should be done in the vicinity of some existing lamp—

The President: In what section would you like to test this experiment?

Mr. Beckwith: I would leave the selection of that section to be determined by the Engineer of the Board. I am not prepared to name any particular section.

The President: Where is there a section that has not at present a blower?

Mr. Beckwith: No section of the subway, with the exception of Broadway, from 14th street to 58th street, and Sixth avenue, from 18th to 59th street, is ventilated by an apparatus. Those are the sections which are ventilated. Any of the remaining subways would be suitable.

The President: Which would you think was the best section on which to make the test?

Mr. Beckwith: That is a matter that I should like to take more time to think about.

The President: You say you could take any? Why do you not take any section?

Mr. Beckwith: Broadway, south of 14th street—

The President: You do not want all of that tested?

Mr. Beckwith: No, sir; only a certain limited space.

The President: What space? How much do you want?

Mr. Beckwith: Say 14th street to Astor Place; or I should think Broadway, south of 14th street, and running down to 8th street, would be a reasonable distance. It may be difficult, your Honor, after this is done, to obtain definite results as to the success of it, because the fact that there might be no explosions occurring there afterwards would not necessarily prove that we were right.

The President: See if you cannot devise some system and make a report to the Board about it at the next meeting.

Mr. Beckwith: Very well. I will endeavor to do so.

Com'r Gibbens: I see no reason why the Board of Electrical Control should not authorize, and, in fact, instruct this Construction Company, to try every means of

ventilating these manholes; but at the same time I cannot see that that would obviate the difficulties the city is laboring under as to the escape of gas. I would suggest that the experiment be made under the direction of our Engineer, under the supervision of Mr. Smith, before the next meeting, and that there should be a report made to us.

Mr. Kearny: We could not report at the next meeting.

The President: Mr. Bayles is here, and I would like to have him tell us what he thinks, as President of the Health Department, upon this subject?

Mr. Bayles: On what point?

The President: I would like to know from you, as President of the Health Department, what you think your authority is upon this matter, and how you think it affects the health of this city?

Mr. Bayles: The leakage of gas and the saturation of the soil with it undoubtedly affects the public health, not because it has toxic qualities, but it generally makes people sick and predisposes them to other diseases. I do not think the escape of gas would necessarily carry them off, but it makes them liable to be sick.

Com'r Gibbens: Do you not think that the gas arising from the soil has a tendency to bring into the houses germs of diseases from the soil?

Mr. Bayles: I should expect it to work the other way. The presence of gas and its saturation of the soil would rather tend to discourage than to accelerate such things. On that point I cannot speak positively, because I do not know. I know that vegetable growths form much less readily in such a soil than where it is free from the presence of gas. It is undoubtedly true that most of the streets of the city are more or less saturated with gas. We find that to be so in the cuts which are made to carry sewer connections into the houses. The gas gets into the cellars, and it is quite usual in new houses to have the smell of gas in the cellars and in the buildings. I had occasion to call the attention of your Honor to a case in 12th street, near Fifth avenue, where a complaint was made—I think it was a week ago last Sunday night—of that kind. An inspector found at the time that complaint was made that the wind was blowing at a considerable speed and in an opposite direction, and could not have brought the smell of gas from the gas house. It was found afterwards that there was a great collection of gas in the street. We do not always find a repetition of the nuisance at given points under apparently similar circumstances.

As to the powers of the Board to compel gas companies to prevent those leaks, the Board has ample power to compel them to repair a leak when a leak is known to exist. Whether they can go beyond that, I am not prepared to say. But, if it is your pleasure, I will advise myself on that point and report to you.

The President: The Board would be very much obliged if you would do that. We would like very much to have this subject tested and settled.

Com'r Gibbens: Let me suggest that Mr. Loomis, the Engineer in charge of the Sewers, is here.

The President: You have heard the statement of Mr. Bayles just now about the sewers. Mr. Smith made certain statements yesterday. What have you to say upon this subject?

Mr. Loomis: As far as the explosions of gas in sewers are concerned, I will state that there has been four explosions in the past year. Three of them occurred last June, and one of them in the month of January last. These were all caused by men entering the sewers with lights, for the purpose of cleaning or examining the sewers, and in that way igniting the gas which was found at certain places. In three of these cases the sewers had tight covers. The men report to me that they entered the sewers from ten to twenty minutes after these covers were opened for ventilation. Probably they did not leave them open long enough to produce a circulation of air there.

But these explosions occur in the most unexpected way. These men tell me that they have no warning whatever of anything of the kind until suddenly there is a flash and an explosion. Some of the men get hurt, and there the thing ends.

The President: How do you account for the fact? Do you think it is due to an atmospheric change, as has been mentioned here, or such a case as the President of the Health Department speaks of, where the sewer was on one occasion full of gas, and on another occasion comparatively free from it.

Mr. Loomis: I have not had that case brought to my attention. What Mr. Bayles has said is the first I have heard of it. Currents are often going in opposite directions through the sewers, sometimes in and sometimes out, so that it is very likely that a different direction of the wind might cause a different direction to the current of air in the sewer. These gases that have exploded in the sewers are described to me as being in "pockets," so to speak.

The President: There is no doubt about its being illuminating gas?

Mr. Loomis: Not the least doubt of it. We have traced it directly to the gas pipes. We often find gas pipes running through the culverts that connect with the street basins at the corners of the streets, and frequently they are lying right along side of manholes, where an opening in the joints of the masonry between the bricks would allow free access of the gas to the sewer. On this occasion, which occurred last January, which was in 42d street, near Sixth avenue, the men were examining it for dirt. They started in the manhole, and came along up until they got near Sixth avenue, and after they passed the last manhole, and they were up near the sewer, the gas had followed and reached the highest point of the sewer, and the man got near the end of it with his lamp, and there was suddenly an explosion, and he was very badly injured.

Com'r Gibbens: Have any of our men ever been killed by these explosions?

Mr. Loomis: No, sir; but this man's life was not worth a button for a long time. He is hardly able to do anything now.

Mr. D. Lowber Smith: Do you not think that the gas is more likely to be affected

in the sewer on such a rainy, muggy day as yesterday, and do you not think the condition of the atmosphere has a good deal to do with it?

Mr. Loomis: I do not know that it has.

The President: You have no doubt but that this was due to the presence of gas in the sewers?

Mr. Loomis: No, sir; not the slightest. The covers were not perforated, and there had not been an opportunity for sufficient ventilation before the men went in. They get careless about these things, and do not realize what risk they run. They go in before a current of air is established and before the foul air has had a chance to blow out.

Com'r Gibbens: Did your experience lead you to think that the gas pipes could be made practically tight so that these leaks would not occur?

Mr. Loomis: It is possible to make them tight.

Com'r Gibbens: Mr. Beckwith, in regard to your statements in the report read by Mr. Lauterbach, where you said that twenty per cent. of the gas escaped in the street, or fifteen, at any rate, that was contradicted by a representative of a gas company yesterday, who said that not more than five per cent. of the gas escaped. Do you still hold to your statements?

Mr. Beckwith: I believe my statement was nearer correct. I understand that in several investigations the sworn testimony of officials of the gas companies showed that fifteen per cent. was about the average escape through the city. I have understood on very good authority that in the older portions, where the pipes have been laid a long time, in the lower part of the city, twenty per cent. was very possible and not unusually to be expected. I believe that fifteen per cent. is a fair average, as far as I can find out. Mr. Jackson states that in Philadelphia twelve or fifteen per cent. of waste or leakage is what is reckoned upon in that city.

Com'r Gibbens: There was a gentleman here yesterday who made a statement about the mains of his company. I think his name was Enfers. He made a statement to the effect that the workmen building the subways had destroyed the efficiency of his pipe, and that the leakage was a great deal more since the subways were laid than it ever was before. As a matter of fact, if the workmen on the subways injured the pipes of the gas company there would be, of course, an immediate remedy in the hands of the gas company. At the same time I would like to ask him if that is true. Do you know of any such case as that?

Mr. Enfers: No, sir; I do not believe it is true. I know of no such case. On the contrary, the opening of the trenches for the subways has afforded an opportunity for recaulking long lines of gas mains which have been on the line of the subways or adjacent thereto. The expense of that caulking has been done at the expense of the Construction Company.

Com'r Gibbens: Will you please state what you know about that pipe in Sixth avenue which was found when you were building the first subway?

Mr. Enfers: There were several lines of pipe there, some of which had to be removed in long lengths. The pipe was in such condition that the old pipe could not be replaced, and new pipe had to be substituted at the expense of the Construction Company.

Com'r Gibbens: Did you understand at the time that you substituted that pipe that the subway was not using that main at all?

Mr. Enfers: I am unable to state positively about that.

Com'r Gibbens: Was it you who told me that, Colonel?

Mr. Kearny: I may have told you. A good many blocks of the mains had no connection whatever with it.

Com'r Gibbens: And the Company was not using the mains?

Mr. Kearny: So I was informed.

Com'r Gibbens: And the gas was not passing through them at all?

Mr. Kearny: I understood there was no gas in them.

The President: Have the representatives of the gas companies anything further to say upon this subject?

A Voice: I would like to have the Engineer of the Consolidated Company say something.

The President: What is the gentleman's name?

A Voice: William H. Bradley.

The President: What has Mr. Bradley to say upon the subject?

Mr. W. H. Bradley: I do not know what is wanted.

The President: You are the Engineer of the Consolidated Company?

Mr. Bradley: Yes, sir. In regard to this matter of leakage, it seems to be pretty well established that there is leakage. I wish also to say that notwithstanding some of the opinions that have been expressed here to-day, it is simply impossible to prevent leakage to any extent. There have been figures brought forward showing that the leakage was from fifteen to twenty per cent. That is true in one sense and untrue in another. The fifteen or twenty per cent. is what we call "unaccounted-for gas," which is gotten rid of in various ways, such as over consumption in the street lamp, and defective meters not registering, and condensation, contraction and all other ways in which gas disappears. The absolute leakage is enormously stated when it is put at five per cent., when we come to think what these figures mean.

Com'r Hess: You mean the absolute leakage from the pipes?

Mr. Bradley: The absolute leakage from the pipes. The balance of the percentage is made up in different ways, where it does not annoy anybody and does not get into the ground. I will illustrate it. This is a pretty large room. If we should let five cubic feet of gas into this room it would be almost impossible to sit in it. When we consider those facts, we know that it takes but very little gas to make a bad smell. When we smell gas we think there is necessarily a very bad leakage. It is not necessarily a large quantity. The pipes have laid in the ground in some cases from thirty to forty years, and a very minute quantity of gas escaping from them will so saturate the soil that it will smell when it is turned over.

The President: Of course, you have heard the statements of this gentleman from Pittsburg, Mr. Jackson, about the method of saving gas in use there. He seems to know what he is talking about.

Mr. Bradley: As I understood Mr. Jackson's statement he does not prevent leakage; he simply disposes of it.

The President: He actually prevents the leakage into the air by saving it.

Mr. Bradley: Excuse me, your Honor, he did not say so.

The President: But I understand him to say so. Mr. Jackson, do you say it does not escape into the air?

Mr. Jackson: If it leaks, it does, but we have a method, by means of the escape pipe, of discovering whether we have any escape. If the leak is large, we correct it at once, those vent pipes being the means of discovering our leak.

The President: Do you actually have any escape of gas that you do not burn?

Mr. Jackson: Yes, sir. If there is an escape in those globe joints of ours, which come to the surface, we light it at our escape pipe, which are at various street corners.

Com'r Moss: Then you do not lose it?

Mr. Jackson: We light it there. That is the way we discover that we are having a leak at all. If that leak amounts to anything of importance we remedy it immediately.

Com'r Moss: Your gas pipe does not leak into the soil?

Mr. Jackson: Not at all. There is no leakage of gas which gets into the soil. We could not afford it for a moment. We have had all the experience of that kind that we want.

Com'r Hess: How high is that stand pipe?

Mr. Jackson: About ten feet.

Mr. Bradley: Mr. Jackson does not say now that the pipe does not leak?

The President: But it does not leak into the soil. That is all we ask. We cannot require anything more than that you shall confine the leak.

Mr. Bradley: The trouble, your Honor—

The President: Do you think that is a practical idea?

Mr. Bradley: I think it is possible in the section of the country where Mr. Jackson operates, but not here.

The President: Why not?

Mr. Bradley: Simply because there is such an immense network of pipes in the streets, and these globe joints must necessarily take up room.

The President: Not according to his description?

Mr. Bradley: Yes, sir; they must take up four feet across.

Mr. Jackson: No, they would increase the diameter about four inches.

Mr. Bradley: Two inches on each side?

Mr. Jackson: Yes. I would like to say that if we had one-half of one per cent. leakage we should think we were terribly wasteful. We could not afford to have one-half of one per cent. leakage.

Mr. Bradley: We think so, too, but we cannot help it.

Mr. Jackson: We did have it, but we have taken means to remedy it.

Mr. Bradley: Another difficulty is the constant turning over and upheaval of the street. Broadway, from 23d street to 34th street, has been in a condition of perfect chaos for two years.

The President: To get back to the subject of discussion here, is there any other region except the turning up of the street that you claim makes this method not applicable to the City of New York?

Mr. Bradley: I should like to investigate it a little further, and get at the merits of it.

The President: What I am endeavoring to ascertain is this: Do you claim that gas escapes through the joints of the pipe?

Mr. Bradley: The gas will escape through the pipes in years of time.

The President: You mean after they have become rotten?

Mr. Bradley: No, sir; I never saw a rotten pipe. I have seen them rusted, but not rotten. After the pipe has remained in the soil for a considerable length of time the gas will percolate and work through a cast iron pipe, and the surrounding soil will have an odor of gas; but it is not necessarily an escape of gas. It is an odor of gas.

The President: You claim that it does not percolate through a new pipe, but it does through an old pipe.

Mr. Bradley: No, sir; it begins to percolate as soon as a pipe is laid, but it takes time to get through.

Com'r Gibbens: How about a wrought iron pipe?

Mr. Bradley: It would not percolate through a wrought iron pipe, but the wrought iron pipe would be quicker destroyed.

The President: It would percolate through a cast iron pipe?

Mr. Bradley: It would in time.

The President: In how long a time do you say?

Mr. Bradley: Perhaps there would be an odor from the pipe after it had laid in the ground ten years.

The President: You think it would not until the lapse of ten years?

Mr. Bradley: It might not in ten years. That is a guess, your Honor. I cannot substantiate that, perhaps, by any proof.

The President: My purpose is to have the test, if I can. That is the reason I want you to make a statement.

Mr. Bradley: It can be tested, undoubtedly, by digging up some of our pipes that have been laid in the ground for some time.

The President: I think it can be tested without that. Suppose you were to take a pipe here and put some pressure on it?

Mr. Bradley: You could not force the gas through within any reasonable life time.

The President: Of course, if you say it would take ten years, I do not think your statement that it percolates through the pipe could very readily be proven. Yours is merely a theory.

Mr. Bradley: It is a theory.

The President: Then there is no practice to it?

Mr. Bradley: The chief difficulty with regard to leakage, as I was about to say before, comes from the constant disturbance of the streets.

Com'r Gibbens: Who disturbs the streets the most, Mr. Smith?

Mr. Bradley: We all take a hand in it.

Mr. D. Lowber Smith: The gas companies.

Mr. Bradley: Yes, simply for one reason. The Croton pipes are laid and the sewers are built, and after they get all through with them we have to dig up the streets in order to stop the leaks.

The President: Do you not think that a company that manufactures gas that condenses and freezes is somewhat at fault? If the companies make a proper quality of gas it would not condense so readily, would it?

Mr. Bradley: No, sir.

The President: The reason there is a great deal of street opening on account of frozen gas mains is due to the fact that the gas is not of good quality, is it not?

Mr. Bradley: No, sir; that is due to the gas carrying vapor in suspension.

The President: But the quality of the gas has a great deal to do with the condensation of it.

Mr. Bradley: No, sir; gas will not condense. Vapor will condense.

Mr. D. Lowber Smith: Any gas may carry vapor?

Mr. Bradley: Yes, sir.

The President: The quality of the gas depends upon how much vapor there is in it?

Mr. Bradley: No, sir; the condition of the air is responsible for the quantity of vapor it takes up. If it loads itself up with vapor, and in passing through the mains it passes through a cold place the gas will freeze.

The President: Is there not a difference between a gas which is less devoid of vapor than another?

Mr. Bradley: No, sir. All gases will carry vapor.

The President: Does not the registration of the meter vary considerable where there is considerable vapor and where the gas is minus of vapor?

Mr. Bradley: Yes, sir.

The President: Then the meter will register greater when the gas has more vapor in it?

Mr. Bradley: It will register more with more vapor in it. The action of the gas in passing through the pipe causes the vapor to be taken out of it. It scrubs the gas, as we say.

The President: In reference to the question of the necessity for opening the streets, then, the more condensation there is the more the streets have to be opened?

Mr. Bradley: No, sir. We do not consider it that way. We have drop boxes, the same as culverts, and it is pumped out.

The President: That is, before it condenses. But do you not have frozen gas mains?

Mr. Bradley: Occasionally.

The President: Why is that?

Mr. Bradley: Because the vapor is not condensed.

The President: Please make a full statement in regard to that? I consider you a person who ought to know.

Mr. Bradley: We are willing to do whatever we can to help remedy the difficulties which are under investigation. It has been said this morning that we do not repair the leaks. We do repair them just as rapidly as we are notified of them. We cannot find them unless somebody notifies us of them.

Com'r Gibbens: Do you keep a record of the pipes you lay down, and the number of years they have been in the ground?

Mr. Bradley: Yes, sir; we have such a record. For some years back it is very perfect. Previous to that time the record is not accurate.

Com'r Gibbens: Do you renew the pipes when they are in such condition as you have spoken of?

Mr. Bradley: We always renew them when they are unsuitable to transfer the gas, when we know it.

Com'r Gibbens: What do you mean by an unsuitable pipe?

Mr. Bradley: When the pipe is rusty or broken or leaks from any cause whatever.

Com'r Gibbens: When it is in such a condition that the gas escapes?

Mr. Bradley: Yes, sir.

Com'r Gibbens: So that you do not believe the gas company is entitled to let its gas leak into the streets?

Mr. Bradley: I do not think our stockholders would believe so.

Mr. D. Lowber Smith: Are your mains laid by contract?

Mr. Bradley: We lay some by contract, but very few.

Mr. D. Lowber Smith: How is that determined? Is the contract given to the lowest bidder?

Mr. Bradley: No, sir. In the case of the contract we made last year, a reputable contractor in the city was asked what he would lay the pipe for. He made his estimates, and it was accepted, and he laid them.

Mr. D. Lowber Smith: Do you specify the quality and quantity of iron?

Mr. Bradley: Yes, sir.

Mr. D. Lowber Smith: Do your specifications demand four inches of lead in the joints? If you only get two, and you pay for four, the gas comes out of that joint?

Mr. Bradley: We have an engineer on the ground all the time, whose business it is to see that the contract is carried out. We lay most of our own pipes.

Mr. D. Lowber Smith: One of the gentlemen stated something about a portion of the unknown quantity of gas not being registered by the meter. I do not take any stock in gas meters except as a sample of perpetual motion.

Mr. Bradley: There is a large quantity of gas unaccounted for. I remember an instance. It happened some years ago, and, as the place has changed hands now, I will not mention it and throw discredit on anybody. There was a certain place in the city where ninety burners were running from lighting up until midnight, where a connection was made without the gas passing through the meter. That is only one instance. The thing ran along all winter.

Com'r Hess: In other words, they stole a connection?

Mr. Bradley: Yes, sir; and they were not Presidents or Engineers of gas companies, and it was supposed that they were honest, but they were not.

The President: But that does not occur very often, does it?

Mr. Bradley: It occurs oftener than you imagine.

The President: I give all the gas companies credit for being more watchful than that.

Mr. Bradley: We had a leakage occur over here on the west side of town the other day from the breakage of a water main. That goes in as unaccounted-for gas.

Mr. D. Lowber Smith: I have noticed since I have been sitting here that the general idea is to unload on somebody else. The gas companies charge their defects on the steam pipes; the steam companies charge it to the subway; and I suppose the Subway will bring their charges against the Board of Public Works. I am waiting for that.

Mr. Bradley: Pardon me; I do not propose to go into that.

Mr. D. Lowber Smith: If we had anything to say as to the nature of the plant that these people put under ground, it would be very much to the benefit of the city. If more power were vested in the Department of Public Works, I think we could obviate the difficulty before the Board. As it is now, none of the companies are responsible to anybody, and no one knows what kind of material is used in the pipes, or, for that matter, no one knows anything at all about their work. The gas companies may lay tin pipes, for all the supervision of the Department of Public Works is concerned. As it is, if any company comes to the Department for a permit to open a street the Department necessarily must give it. After that permit is granted it seems to be nobody's business what the company does, or how it is done.

The President: You have nothing to do with the supervision of the laying of the pipes of these companies?

Mr. D. Lowber Smith: Nothing to do with any of them.

The President: But, if they ask permission, you have to grant it?

Mr. D. Lowber Smith: We have to grant it.

Com'r Gibbens: Suppose you were put in possession of the power to provide in what way the steam companies and the gas companies should make their joints and test their pipe, do you think you could have the gas pipes tight?

Mr. D. Lowber Smith: I think I could. I know there would be considerable trouble about it, but we could have something to say. As it is now, we have nothing to say. These companies do just as they choose. There is no supervision over them at all, except by their own stockholders, and the effort seems to be to have the work done as cheaply as possible instead of having it done as well as possible, although I

should suppose that the two things would go together. I think five per cent. of gas is a very large quantity to leak into the streets, and that it could be prevented.

Mr. Bradley: We purchase our pipes from the same maker from whom the Croton pipes were purchased.

Mr. D. Lowber Smith: Your pipes are not coated with tar inside and out?

Mr. Bradley: The reason is that the gas would take the tar out of them.

Mr. D. Lowber Smith: They might be coated outside?

Mr. Bradley: Yes, sir.

Mr. D. Lowber Smith: They never put any tar on them at all?

Mr. Bradley: No.

Mr. D. Lowber Smith: I do not know what the pressure by which you test them can amount to, for they look as if they were full of sand holes.

The President: Do you believe there can be no test in the street?

Mr. Bradley: No, sir; in order to make a test in the street it would be necessary to go to every house supplied with gas and shut off the meter connection. It would take a week to do it. The new mains can be tested, but the mains now laid cannot be tested.

Mr. D. Lowber Smith: I think that is reasonable. You would have to shut the gas off from every house in the city in order to do that.

Com'r Gibbens: Suppose it does take a week to test them. It would be better to do so, if you are liable to have an explosion otherwise, which would blow up a house or a street.

Mr. Bradley: We would hear from you, Mr. Gibbens, if you had no light for a week.

Com'r Gibbens: I would a good deal rather have my house dark for a week than be liable to be blown up. You have already heard gentlemen here say that sewers have been in a condition where they have been blown up, and that they are in that condition now.

Mr. Bradley: Not with perforated manholes.

Com'r Gibbens: In the sewers there is a passage of air and water always, and currents of air are there. But you can have the same thing occur in the cellar of a house.

Mr. Bradley: Most undoubtedly.

Mr. D. Lowber Smith: You cannot cut off any particular district by stop cocks in the houses?

Mr. Bradley: No, sir.

Mr. D. Lowber Smith: You would have to cut off every house on the line of distribution?

Mr. Bradley: Yes, sir. It is practically impossible.

The President: How far do the lines of your distribution extend?

Mr. Bradley: From the Battery to Kingsbridge.

The President: What is the average territory?

Mr. Bradley: There is one set of mains that is almost isolated—from Grand street to the Battery, for instance; then from Grand street to 34th street; then from 34th street to 79th street; then from 79th street north. That is across the city.

The President: These are the only four distributing points?

Mr. Bradley: There are others that run from Grand street to 79th street.

The President: In other words, you would have to make a test from the old gas companies' houses?

Mr. Bradley: Yes, sir; the old districts would have to be cut off, each by itself.

The President: Then any single district, such as the old Metropolitan Gas Companies, could not be tested unless they tested their entire system?

Mr. Bradley: Not unless they tested their entire system.

The President: There is no other remedy that you can suggest, is there?

Mr. Bradley: I can see no remedy except by ventilation. There are a number of ways of ventilating. I should think it would be a very simple thing to do. It seems to me so. The fact that there are no explosions in the sewers——

The President: You say there are none?

Mr. Bradley: Nothing to speak of.

The President: Mr. Loomis seemed to think to the contrary.

Mr. Bradley: We have had four within a year. The Subway Company has had a good many in less time than that.

Com'r Gibbens: No, let me correct you; they have not. They have had ten in three years.

Mr. D. Lowber Smith: There have been ten after having taken all the precautions that were deemed necessary. We never enter a manhole until it is left upon for hours for the purpose of ventilation.

Mr. Bradley: I do not think these explosions come from the constant leakages from the gas mains. I think they are, in almost every case, the result of an extensive breakage or leakage from a cause that arises without the steady leakages, and that it will be so.

Com'r Gibbens: We have had a different opinion stated here this morning.

Mr. Bradley: I think the mains will break, and there will be a sudden rush from the mains into the manhole, or from a loose joint, or the lead will come out. I do not think it is the result of steady leakage.

The President: Somebody said here yesterday that engineers and doctors and gas companies disagree.

Mr. Bradley: Most always.

The President: There is a decided disagreement about this.

Mr. Bradley: If we all thought alike there would be no question on the subject.

The President: It seems to me this ought to be a thing that you should all be able to find a remedy for readily.

Mr. Bradley: In all cases where we have had explosions—and we have them in different points; in cellars and basements, and so on—we have always traced it directly to a fresh break, and not to a steady, continued leakage. I do not think that has been mentioned before, but I think all the representatives of the gas companies will bear me out in that statement.

Com'r Gibbens: Mr. Andrews asserted to the contrary. He said it was not due to a sudden break, but to a flowing in from a saturated soil.

Mr. Andrews: I beg to correct that. Evidently the direct leak would be the immediate and prompting cause of the explosion, far in excess of the result of any steady leakage. There may be steady leakage, but not sufficient in quantity to produce an explosion, and it may exist for years. That is evident. It is a question of volume. Both parties are right in a certain sense.

The President: I cannot agree with you, Mr. Andrews.

Mr. Andrews: Well, I think so. I think this gentleman's statement is evidently correct—that the immediate cause is where there is a fresh break.

The President: I think he makes that statement a little stronger, and I think both parties are modifying their statements, if that is correct. You can have it so, if you wish.

Mr. Andrews: I concede that a fresh break is more likely to cause an explosion, because it is greater in volume. The other being a smaller percentage, it may exist for years and cause no explosion. And still it may.

The President: Did you not say that most of these explosions, when you were asked if these holes were open two or three hours for ventilation, might be caused by the natural accumulation of gas from a soil saturated with it? Did you not say that that was more likely to cause it than any other cause?

Mr. Andrews: Together with the leakage of joints.

The President: But did you not make that statement at the time?

Mr. Andrews: I mean this: That first the soil is saturated from the accumulation of years. That is the first step.

The President: I understand that. I understand what you now say; but I am stating what you said a while ago. Your other statement was that you thought it was due to the saturation of the soil?

Mr. Andrews: I think that would get into the manholes and produce an explosive mixture.

The President: After the three hours that have been spoken of?

Mr. Andrews: It is a question of condition.

The President: Do you agree with that, Mr. Bradley?

Mr. Bradley: I stand by what I have said.

The President: That it could not be caused by the flowing in from the saturated soil, after three hours.

Mr. Bradley: I shall have to disagree with Mr. Andrews on that.

The President: Mr. Flannery is asked to appear. Mr. Gibbens says he would like to have Mr. Flannery make a statement.

Com'r Gibbens: We want to understand whether it is possible to construct gas pipes so that they will not leak in such enormous quantities as to saturate the soil of the city and cause explosions.

Mr. Flannery: Gas pipes are so constructed.

Com'r Gibbens: Whose gas pipes?

Mr. Flannery: Our system is practically in that condition.

Com'r Gibbens: How do you construct your gas pipes?

Mr. Flannery: The majority of them are wrought iron.

Com'r Gibbens: Can you tell us generally what you think upon this subject?

Mr. Flannery: I will answer any questions.

Com'r Gibbens: Do you think the construction of gas pipes in this city, aside from those of your own construction, is proper?

Mr. Flannery: I think they are very good.

Com'r Gibbens: Take them altogether?

Mr. Flannery: Yes, sir.

Com'r Gibbens: All the companies?

Mr. Flannery: Yes, sir.

Com'r Gibbens: You refer to those that use cast iron pipes, as well as those that use wrought iron pipes?

Mr. Flannery: It was only possible to use wrought iron within a few years past. We happened to be the latest company, and we have learned a great deal from the natural gas people. This unknown quantity was a problem until we worked it out.

Com'r Gibbens: You think you have worked it out now, do you?

Mr. Flannery: We feel that we have bettered the condition.

Com'r Gibbens: How much do you propose to leak? What is your maximum leakage?

Mr. Flannery: That is a difficult question. Permit me to say that the percentages of leaks show nothing. If one man sells nine million feet of gas per mile of main, he may tell you that he is losing six per cent. of his gas. Another man may say that in Philadelphia, for instance, out of a three million feet of gas per mile of main he would be losing 18 per cent. But the quantity might be identically the same, don't you see? The nuisance that you are trying to avoid would be the same. So per cents say nothing. A New York Company may turn out twelve million feet of gas to the mile of pipe and tell you it is leaking five per cent.

The President: But, as I understand it, it is the entire consumption——

Com'r Gibbens: Mr. Wheeler, our expert, suggests that the size of pipes varies, and that the percentage does convey an idea as to the quantity of gas used——

Mr. Flannery: It does not to me, I assure you. Take the city of Philadelphia. They average three million feet per mile of main.

The President: When you say per cents, what do you mean, Mr. Bradley?

Mr. Bradley: I mean the unaccounted-for gas of the total amount made. We keep our accounts in that way. Mr. Flannery is right in another respect. What Mr. Flannery intends to say, as I understood it——

The President: You came here and made a statement of percentages?

Mr. Bradley: Exactly.

The President: Were you, or not, talking intelligently then?

Mr. Bradley: I was.

The President: Do you understand Mr. Bradley to have been talking intelligently?

Mr. Flannery: Yes, sir.

The President: Under that understanding, let us have your argument. We will not go into the engineering argument. You make your statement based upon his standard of per cents?

Mr. Flannery: What concerns your Honor and this Commission and the public is the quantity of gas escaping into the streets.

The President: That is the unaccounted for per cent.

Mr. Flannery: Yes, sir. Well, the per cent. says nothing.

The President: We do not care about having that statement over again. We know there is an escape. You say Mr. Bradley is talking intelligently when he is making a statement of percentages?

Mr. Flannery: He is an expert talking.

The President: Are you an expert?

Mr. Flannery: Yes, sir.

The President: Are you an engineer?

Mr. Flannery: Yes, sir.

The President: From that basis we want both of you to make a statement. We do not want to know whether your theory of engineering is proper or his is proper. We are after a question of fact.

Mr. Flannery: It is a question of fact.

The President: Is he talking intelligently?

Mr. Flannery: He is, very, to me.

The President: Then we wish you to make your statement in the same line with him.

Mr. Flannery: I will give you the argument in a moment, if you will let me explain it. In the city of Philadelphia—

The President: But we do not want to get at some theory. We want to get at something practical. He makes a statement based upon the percentage of escapes, and we want to hear you upon that.

Mr. Flannery: Now, your Honor, some companies sell probably ten million feet of gas per mile per annum.

The President: I do not care if they sell fifty million.

Commissioner Gibbens: How much better is your construction than the other one?

The President: That is what we want to get at.

Mr. D. Lowber Smith: What total production of gas do you lose? Is it as much as one-twentieth?

Mr. Flannery: Not now.

Mr. D. Lowber Smith: One-tenth?

Mr. Flannery: No.

Mr. D. Lowber Smith: One fifth?

Mr. Flannery: We have not figured it up. It is not appreciable in our system. We have lost some.

Mr. D. Lowber Smith: What proportion of the total production?

Mr. Flannery: Then you want to know per cents.?

Mr. D. Lowber Smith: No. What fraction? I do not care anything about the per cents. Is it one-tenth of the total production?

Mr. Flannery: No, sir; not one-twentieth.

Mr. D. Lowber Smith: Then we understand that. What proportion of that quantity that you lose do you estimate as getting into the soil from the joints of the pipe?

Mr. Flannery: What we lose I must confess principally goes into the soil.

Mr. D. Lowber Smith: What proportion?

Mr. Flannery: Call it five per cent. if you please.

Mr. D. Lowber Smith: I am eliminating the per cent. feature entirely.

Mr. Flannery: One-twentieth of the volume.

Mr. D. Lowber Smith: That amount does escape into the soil?

Mr. Flannery: We will assume that. I cannot tell exactly.

Mr. D. Lowber Smith: That is five per cent.?

Mr. Flannery: Yes, sir.

Commissioner Gibbens: That is what Mr. Bradley claims as to his company?

Mr. D. Lowber Smith: Your statement about the loss does not seem to maintain what you said about the pipes?

Mr. Flannery: Mr. Bradley is probably selling ten million feet per mile per annum, upon which he counts his per cent., and we sell less than two million.

The President: We are not talking about percentages now.

Mr. Flannery: Five per cent. in the one case and one per cent. in the other might be exactly the same quantity.

The President: We want to get at the percentage of the amount used. The per cent. on five is the same as the per cent. on twenty?

Mr. Andrews: Mr. Flannery is strictly correct.

The President: He may be correct, but we do not want to decide the question whether Mr. Flannery's theory of it or Mr. Bradley's statement of it is correct. We want to get at the practical results.

Mr. Andrews: It flows through the pipes.

Mr. Flannery: I can convey to you my sense of it also—that the proportion of loss to the mile would be the same if the conditions were the same.

The President: Then you do not think that yours is an improvement upon the others, do you?

Mr. Flannery: Most decidedly I do.

The President: You believe the escape from your pipes is hardly perceptible?

Mr. Flannery: So far, excepting at broken points. In our system, unless it breaks, we have no leakage. We have our pipes tested.

The President: Have your pipes all been tested?

Mr. Flannery: Every foot of them, by personal inspection at the foundries, at the mills and in the streets.

Commissioner Gibbens: I offer the following resolution:

Resolved, That a committee be appointed by the Mayor to draft a report on this investigation, to be submitted to the Board for its action at the earliest possible moment.

Unanimously adopted.

The President: The Chair will appoint Commissioner Gibbens and Commissioner D. Lowber Smith.

Commissioner Gibbens: Mr. Mayor, if there is nothing further before the Board, I offer the following resolution:

Resolved, That the Board adjourn subject to the call of the Chair.

Unanimously adopted.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, April 24th, 1889, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel L. Gibbens, Theodore Moss.

The minutes of the last meeting were read and approved.

Commissioner Gibbens stated that there was a communication before the Board from Hon. William R. Stewart, who is Chairman of one of the committees on the Centennial Celebration, in regard to lighting an arch in Fifth avenue at Washington Square during the time of the celebration, and asking to be allowed to make connection with the Edison Subway System for that purpose; and that he, the Commissioner, had written to Mr. Stewart and asked him to have present at the meeting to-day some representative of his committee, or of the company that desired to make the connection, and explain the matter to the Board, in order that it might be informed.

Mayor Grant stated that he had received a communication from S. V. R. Cruger, chairman of a committee on the Centennial Celebration, stating that the committee had applied to the Western Union Telegraph Company to place a wire at its disposal along

the line of march of both the military and industrial parades, with operators stationed at nine different points.

Commissioner Gibbens said that he would state in this connection that a communication from S. McCormick, Superintendent of Lamps and Gas, had been received by the Board, to the effect that if a wire could be carried from the candelabra lamppost opposite Fifth Avenue Hotel, at 23d street, to the nearest electric lamp in Madison Park, then that lamp could be lighted.

Mayor Grant: It depends entirely with me which the company is. I have got to this: I have caused an examination to be made, and I want to ask any of these companies applying for permits here to-day how many wires they have put up, without authority, before I grant any.

Commissioner Gibbens: This matter is not a question of the companies, but of the conveniences to the city and people. Now, the matter of lighting Madison Square Park would be looked upon from the standpoint of the public.

Mayor Grant: If these people can go on stringing wires without any authority of this Board, this Board might just as well go out of existence. I shall not vote for a permit to a company that has in bad faith strung a wire, without the consent of this Board, unless it has proven an intent to do better in the future. If there are representatives of companies applying for permits, present, I would like to ask them questions. Mayor Grant thereupon asked representatives of the Brush, Manhattan and Harlem Electric Light Companies questions touching the unauthorized stringing of wires in various localities of the city mentioned by him, and they all disclaimed any knowledge of any such violation of the Rules and Regulations of the Board.

Mayor Grant: I want to have read for the benefit of the Board a report from the Superintendent of the Police in answer to a communication addressed by me to him, and I want to place it on file.

The following communication and accompanying report was then read:

NEW YORK, April 16th, 1889.

HON. HUGH J. GRANT, Mayor:

DEAR SIR:—In reply to your letter of 10th inst., I respectfully transmit herewith copy of report of the investigation made by Inspector Williams in reference to the stringing of wires by the Manhattan Electric Light Company, from 86th to 80th streets, on Third avenue.

Respectfully,

WILLIAM MURRAY, Superintendent.

NEW YORK, April 15th, 1889.

WILLIAM MURRAY, Superintendent:

SIR:—I have made a careful investigation into the allegations set forth in the annexed communication from his Honor Hugh J. Grant, Mayor of New York, and I find that on Saturday, the 6th inst., the Manhattan Electric Light Company strung some wires on poles on Third avenue between 80th and 86th streets, and while so doing were stopped by Patrolman John A. Finnan, of the 27th Precinct, who demanded to see their permit; the person in charge of the work told the officer that they had a permit, but that it was held by the General Foreman, and that he was at the other end of the line, viz.: at the Harlem River. Their assurance being so strong and their manner so unembarrassed, that the officer had no hesitation in permitting the work to go on, while a messenger was sent to the Harlem end of the line to find the General Foreman and procure the permit; this took quite some time, and the work going on, by the time the messenger returned it was almost complete, the messenger returned with word that the General Foreman had been taken sick and had left the work, taking the permit with him. But the officer was assured that it was "all right." On Monday, the 8th inst., the same party were again on the work, and produced for Officer Finnan's inspection a permit from the Board of Electrical Control, dated December 4th, 1888, granting permission to the Harlem Lighting Company to rebuild a line of poles on Third avenue from 86th street to the Harlem River, and appended to this permit was the following: "This permit is hereby corrected to read from 80th street to the Harlem River as originally intended, instead of from 86th street; mistake due to clerical error." This was signed across the face by Mr. Theodore Moss, whose name also appeared at the bottom of permit; this permit, as now appears, was worthless, as it had been revoked about the 20th of February; but the General Foreman, Frank M. Seirs, of 439 East 80th street, assured Officer Finnan that it had been issued to his Company with the above described amended route, by the Board of Electrical Control, not more than two weeks since, all of which is now found to be false. From my investigation, I am satisfied that the officer accepted the representations of the Telegraph people in good faith, believing they were speaking truthfully, which he should not have done. I have, therefore, preferred charges against him to the Board of Police for neglect of duty. Copy of permit is hereunto attached. It will be seen that there is no date on the correction of Permit which Mr. Moss has endorsed.

Respectfully,

ALEXANDER S. WILLIAMS, Inspector, 1st District.

Commissioner Gibbens offered the following resolution:

Resolved, That the information in the hands of Mayor Grant as to the recent stringing of wires without a permit of the Board be submitted to Expert Wheeler, and that he make an investigation of the charges and report thereon at a meeting to-morrow.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That the matters of the communications of the chairmen of committees

on the Centennial Celebration, read or brought to the attention of the Board at this meeting, and of the communication of Superintendent McCormick as to making of connection with lamp in Madison Square Park, be referred to Expert Wheeler to investigate and make report upon at a meeting to-morrow.

Unanimously adopted.

The following communication was read:

New York, March 21st, 1889.

HON. HUGH J. GRANT, Mayor and Chairman of the Board of Electrical Control:

DEAR SIR:—I have the honor of acknowledging the receipt of your favor of the 19th inst., in relation to the "removal of electrical signal boxes, erected for police purposes in certain parts of the city," and also inquiring what steps have been taken towards placing the police telegraph and telephone wires underground.

The wires and other appurtenances connected with the electric signal boxes were erected for experimental purposes, by the several persons or corporations proposing to demonstrate to the Board of Police the efficiency of their respective telegraph signal systems, with the express understanding that the same would be removed, whenever requested by the Board, at their own expense.

There being no further use for said wires, &c., by the Police Department, for the purposes for which they were erected, notice some time ago was given to the several parties who placed such wires and boxes in position, requesting them to remove the same, and in some instances the request was complied with. Notice has again, this day, been given to the owners or representatives of the persons who erected the remaining wires and boxes, to remove the same forthwith.

Referring to your further inquiry as to the placing of the Police telegraph and telephone wires underground, permit me to say that upon the receipt of a copy of the resolution adopted by the Board of Estimate and Apportionment, transferring the sum of \$15,000, to enable this Department to defray the expense of placing the said wires underground, the Board of Police at once directed the Superintendent of Telegraph to report the streets and avenues where such wires could be placed in conduits and also as to the best method of performing the work.

The report, it is expected, will be presented to the Board at its next meeting and prompt action will be taken, as requested, in all matters pertaining thereto.

Very respectfully,

S. B. FRENCH, President Board of Police.

Mayor Grant offered the following resolution:

Resolved, That the Secretary be directed to notify the owners of the electrical signal boxes erected for police purposes in certain parts of the city to remove them at once, or show cause why they should not be removed, at a meeting of the Board of Electrical Control to be held to-morrow.

Unanimously adopted.

The following communications of the Consolidated Telegraph and Electrical Subway Company were read:

New York, N. Y., March 26th, 1889.

To the Honorable, the Commissioners of the Board of Electrical Control, HON. HUGH J. GRANT, President, 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith beg leave to submit for your approval and authorization the following lines of electrical subway crossings for construction during the present season, and for which we ask your favorable consideration:

1. A telephone and telegraph crossing of Sixth avenue at 27th street, north side.
2. A telephone and telegraph crossing of Broadway at 13th street, north side.

Construction in both cases to consist of wrought iron pipe laid in hydraulic cement concrete.

These crossings are rendered necessary to meet the requirements of the Metropolitan Telephone and Telegraph Company.

Maps showing the location of the above crossings are herewith submitted.

Very respectfully,

EDWARD LAUTERBACH, President.

NEW YORK, N. Y., April 12th, 1889.

To the Honorable, the Commissioners of the Board of Electrical Control, HON. HUGH J. GRANT, President, 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith beg leave to submit for your approval and authorization the following line of telephone and telegraph crossing for construction during the present season, and for which we ask your favorable consideration:

From the manhole on the east side of Broadway at the intersection of 46th street, directly across the street to a flush box to be located on the west side of Broadway at the intersection of 46th street.

The construction to consist of wrought iron pipe laid in hydraulic cement concrete.

This crossing is required at this time to meet the demands of the Western Union Telegraph Company, which has applied for subsidiary connection in this vicinity.

Map showing the location of the above crossing is submitted herewith.

Very respectfully,

EDWARD LAUTERBACH, President

New York, N. Y., April 22d, 1889.

To the Honorable, the Commissioners of the Board of Electrical Control, HON. HUGH J. GRANT, President, 1218 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith beg leave to submit for your approval and authoriza-

tion the following crossings of electrical subways for construction during the present season, and for which we ask your favorable consideration:

1. An electric light crossing of Sixth Ave. at 28th St.
2. An electric light crossing of Broadway at 38th St.
3. An electric light crossing of Broadway at 41st St.
4. An electric light crossing of Broadway at 42d St.
5. A telephone and telegraph crossing of Broadway at the intersection of Pine street.

The construction of all the above crossings, with the exception of those of Broadway at Pine street and Broadway at 42d street, will consist of the cast iron conduit of the Johnstone system. Those at Pine and 42d streets will consist of six wrought iron pipes laid in hydraulic cement concrete.

These crossings are required at the present time to meet the demands of the different electric light companies, the Western Union Telegraph Company and the Metropolitan Telephone & Telegraph Company, who have applied for subsidiary connections in these localities. Maps showing location of the above crossings are filed herewith.

Very respectfully,

E. LAUTERBACH, President.

Engineer Kearny submitted the following report upon the foregoing applications of the Consolidated Telegraph and Electrical Subway Company:

NEW YORK, April 23d, 1889.

To the Honorable, the Commissioners of the Board of Electrical Control:

GENTLEMEN:—I beg leave to report upon the three applications of the Consolidated Telegraph and Electrical Subway Company (hereto annexed), dated respectively March 26th, April 12th and 22d, 1889, for approval and authorization by you of certain subway construction therein particularly specified, referred to me for investigation and report, that I have examined into such proposed construction and recommend that the work be ordered.

Very respectfully,

HENRY S. KEARNY, Chief Engineer.

Commissioner Gibbens offered the following resolution:

Resolved, That the three applications of the Consolidated Telegraph and Electrical Subway Company, dated respectively March 26th, April 12th and 22d, 1889, for approval and authorization by the Board of Electrical Control of certain subway construction therein particularly specified, be granted.

Unanimously adopted.

Expert Wheeler submitted the following report:

NEW YORK, March 23d, 1889.

To the Board of Electrical Control:

GENTLEMEN:—Acting upon your resolution of February 25th, 1889, concerning

double lines of poles in various streets, I have taken up, first, the locating of places where there are lines on both sides of a street, both belonging to the same company.

I find that the Metropolitan Telephone and Telegraph Company have a line on each side of the street at the following places:

First avenue, from 39th to 56th street.
Avenue B, from 15th to 19th street.
Avenue B, from 8th to 18th street.
22d street, from First to Second avenue.
Water street, from Jackson street to James Slip.
Water street, from Roosevelt to Fulton street.
Washington street, from Albany to Morris street.
Monroe, from Rutgers to Catharine.
Oak street, from Oliver to New Chambers street.
New Chambers, from William to Oak street.
Grand street, from Broadway to Elm street.
Grand street, from Greene to Mercer street.
West 4th street, from Grove street to Sixth avenue.
Second avenue, from 32d to 39th street.

Very respectfully,

S. S. WHEELER, Electrical Expert to the Board.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to notify the Metropolitan Telephone and Telegraph Company, which has a line of poles on each side of the street at the following places:

First avenue, from 39th to 56th street,
Avenue B, from 15th to 19th street,
Avenue B, from 8th to 18th street,
22d street, from First to Second avenue,
Water street, from Jackson street to James Slip,
Water street, from Roosevelt to Fulton street,
Washington street, from Albany to Morris street,
Monroe street, from Rutgers to Catharine street,
Oak street, from Oliver to New Chambers street,
New Chambers street, from William to Oak street,
Grand street, from Broadway to Elm street,
Grand street, from Greene to Mercer street,
West 4th street, from Grove street to Sixth avenue,
Second avenue, from 32d to 39th street,

to remove one line in each of those places and place the wires upon the other line.

Unanimously adopted.

The following communication was read:

[APRIL 24, 1889.]

MAYOR'S OFFICE,

NEW YORK, March 23d, 1889.

HON. DANIEL L. GIBBENS, Commissioner of the Board of Electrical Control:

SIR:—Mr. John M. Toucey, the General Superintendent of the N. Y. C. & H. R. R. Co., requests information as to what extent it is desired to place cables in the Fourth avenue tunnel—whether only the tunnel between 42d and 32d streets is meant. Kindly advise the Mayor what answer to make, and oblige.

Yours respectfully,

THOS. C. T. CRAIN, Secretary.

Engineer Kearny stated to the Board that he had communicated with Superintendent Smith of the Fire Department, and that the Superintendent had expressed to him a desire to use the whole of the tunnel, from 42d street to the Harlem River.

The Board, upon the suggestion of Mayor Grant, directed Engineer Kearny to see Superintendent Toucey and explain to him the fact which he (Mr. Kearny) had stated to the Board.

Commissioner Gibbens stated that the Board had before it two communications regarding losses which have occurred on account of the removal of poles, one of these losses being the breaking of a cornice and glass in a show case, and the other being the destruction of a gentleman's hat; and he moved the following resolution:

Resolved, That the communications of M. Cherry, of 594 Sixth avenue, and John V. Broughton, of 110 West 40th street, regarding losses incurred by each of them respectively through the removal of poles and wires from the streets, be referred to the Commissioner of Public Works.

Unanimously adopted.

The following communication was read:

OFFICE OF THE UNIVERSAL GAS LIGHTING COMPANY,

51 STEWART BUILDING,

NEW YORK CITY, March 29th, 1889.

To the Board of Electrical Control:

This Company respectfully petition your honorable body for permission to put up two wires on the poles now standing on Lenox avenue, between 110th and 124th streets, and on 110th street, between 5th and 7th avenues, as per enclosed diagram, the same to be used for lighting and extinguishing the street gas lamps on above named streets.

These wires are not intended to be permanent, but for the purpose of demon-

strating to Gas Companies of this City the practicability of lighting and extinguishing their street lamps from a central point by means of electricity.

Very respectfully,

UNIVERSAL GAS LIGHTING CO.,

L. N. DOWNS, President.

Mayor Grant offered the following resolution:

Resolved, That the application of the Universal Gas Lighting Company, dated March 29th, 1889, to put up temporarily two wires on the poles now standing on Lenox avenue, between 110th and 124th streets, and on 110th street, between Fifth and Seventh avenues, for the purpose of demonstrating to gas companies of this city the practicability of lighting and extinguishing their street lamps from a central point by means of electricity, be denied, and that the Secretary be directed to inform this Company that the subways can be used to make its demonstration.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That a paper of William Maver, Jr., regarding the insulation of underground conductors, be spread on the minutes and printed slips be struck off and sent to each member of the Commission and to the papers that are interested.

Unanimously adopted.

The following is the paper of Mr. Maver:

NEW YORK, March 30th, 1889.

DANIEL L. GIBBENS, ESQ., Commissioner Board of Electrical Control, Broadway and 30th St., New York:

DEAR SIR:—I have your favor of the 1st inst., in which you ask me to place at your disposition a paper which you have been informed I had prepared, relating to electric light insulation and underground wires. In reply, I would say that knowing of the facilities at your command for obtaining information on these subjects, it would scarcely have occurred to me that the said paper contained anything particularly worthy of the consideration of the Board of Electrical Control. But since it appears that others have thought differently, I take pleasure in submitting, in the following pages, in compliance with your request, the subject matter of that paper, to be disposed of as you may please.

In explanation of the elementary style of at least a part of the paper, it should perhaps be stated that it was originally written to explain, in a non-technical manner, the cause of the frequent accidents that have occurred from the use of non-insulating material as a covering for electric light wires, especially overhead wires, and reasons why the discontinuance of the use of such material should be hastened. In the same paper is included incidentally the results of a number of electrical tests, made by the writer, of various kinds of insulating material; some comments concerning the conditions that must be met and withstood by insulating material for underground wires

and a few remarks suggested by the results of practical observations in connection with the construction of underground electric light circuits.

Before proceeding to discuss the main subjects, I shall, briefly as may be, first define more clearly the meaning of the term "non-insulating material," and shall at the same time indicate in advance some of the electrical laws or actions, and terms, to which I shall have occasion to allude in the course of my remarks.

The passage of electricity through a conductor may be likened to the flow of water through a pipe. The pressure of water in the pipe will depend primarily upon the height of the source of supply, if a reservoir be the source, or upon the pumping pressure, if a pump be employed. The strain upon the sides of the pipe conveying the water will increase or decrease with variations in the height of the reservoir, or, in other words, with the initial pressure. If the pressure of the water on the sides of the pipe exceeds its strain-bearing qualities, it will yield, the water will flow out at the break, and, if danger to surrounding property does not ensue, the water, at least, will be wasted. But if the pipe withstands the pressure, the water may be conveyed miles from its source and be utilized, at the most remote point, to advantage. In choosing a conduit for such a purpose, therefore, it would be manifestly unwise to adopt a pipe composed of ordinary card board, or equally weak material, since a pipe composed of such materials would not retain the water long within bounds.

Analogously, electricity is raised to a certain height by a battery, or is pumped, so to speak, into a conducting wire at a certain pressure by dynamo electric machines. It may be assumed for the present purpose that this pressure raises the electricity to a certain height above zero, zero being the earth; and it may also be assumed that the electricity will seek the nearest outlet back to its zero, viz.: the earth. The electricity being thus raised to a pre-determined height or pressure, if a good conductor of electricity, such as copper or iron wire, be employed, the electricity may be conveyed miles from its source and there utilized to advantage. This is assuming that the conductor, if it be a bare wire, does not come into contact, at any point along its course, with the earth, for, in that case, the electricity would escape at that point, and, if no damage to adjoining life or property ensued, the electricity would, at least, be wasted. The electricity does not escape from the bare wire to the earth while suspended in the air, because the air surrounding the wire is a non-conductor of electricity. There is this difference between the results following the break in a water pipe or conduit and the escape of electricity from a wire. In the former case, the danger to life and property will depend upon the volume and pressure of water issuing from the fissure and the physical formation of the ground in the region of the break. In the case of the escape of electricity to the earth, if the current be intercepted by any creature having life, the injury received will depend upon the pressure and volume of the current and its physiological effect upon the particular person or animal intercepting it, or, if the wire should fall on a conductor of moderate electrical resistance leading to the earth, as, for example, a roof, awning, etc., the injury ensuing will be due to the heat generated by the current in overcoming that resistance, and, if the substance should be of an inflammable nature and the electric current of sufficient pressure and volume, fire will result.

There are many other substances besides air which are non-conductors, for example, glass, dry wood, dry cloth, mica, india rubber, gutta percha, etc., and if a conductor of electricity be covered with such non-conducting materials, it may be laid on the ground or underground or under water, without danger of the current escaping

from the wire; this is assuming that the wood or cloth shall be kept dry. When a wire is thus covered it is said to be insulated.

Ordinary moisture is a fair conductor of electricity. Thus wet cloth and paper when water-soaked become fairly good conductors of electricity. It would, therefore, be as manifestly unwise to choose as a covering for an electric light conductor an unprotecting moisture absorbing material or any other non-insulating material with any hope of preventing the escape of the current from the conducting wire to the earth, should it, by any accident, come into contact therewith, as would be the employment of water pipes made of ordinary card board, and expect such pipes to convey water, under a high pressure, in safety.

It is to electric light conductors covered with material of this nature, and which is generally known as "underwriters' wire," "weather-proof wire," etc. (which, in the one case, is a fair absorbent of moisture, and, in the other, a fair conductor of electricity), that I have hitherto referred.

While I have said that some substances are conductors and that others are non-conductors of electricity, this is only to be considered as relatively true, for it is known that all substances are conductors of electricity, but some conduct it so very poorly that, by comparison with those which are good conductors, they are termed "non-conductors." Good conductors are, therefore, said to offer but slight resistance to the passage of electricity through them, while the non-conductors, such as gutta percha, india rubber, mica, etc., offer a very high resistance. This quality of electrical resistance is capable of definite measurement and the unit of resistance is technically termed the "ohm." One ohm, roughly speaking, may be said to be equal to the resistance which a copper wire, one mile long and a little less than a quarter of an inch in diameter, would offer to the electrical current.

Electrical pressure is also measurable and the unit of pressure is technically termed the "volt." This electrical pressure is also measurable at its height at the source of the electro-motive force and the pressure falls directly as it overcomes electrical resistance. For example, assuming an electrical pressure of 100 volts at the source of electro-motive force, and a circuit having an electrical resistance of 100 ohms, the pressure at a point removed a distance of 50 ohms along the circuit would be 50 volts. In ordinary Morse telegraphy the average electrical pressure at the source of the electric current does not much exceed 100 volts, although in special cases a pressure of 300 and 350 volts is employed. This latter pressure, however, having exhausted some of its energy by being caused to pass through a stated electrical resistance before reaching the outside public, has never been known to exert fatal injury to human life, although in some cases it has been known to originate fires, when improperly insulated wire has been used. Shocks, however, from a current of even that pressure are not by any means agreeable, and in a number of cases the operatives in charge of telegraph offices have received severe burns on the hands from accidental contact with the bare wires conveying currents of that pressure.

In electric lighting the pressure ranges from 200 to 2,000 volts, and, in many instances, the current is delivered at the lamps at almost the same pressure at which it leaves the dynamo machine.

With regard to the effect of receiving a shock from a current of 2,000 volts pressure, while some claim to have withstood it, that or even a much lower pressure may be considered as very dangerous to life if the bare or improperly insulated con-

ductor should be touched by a person standing on the ground, thereby diverting the current through his own body to the earth.

The electrical resistance of the insulating material of one mile of wire covered with a good quality of insulation would be equal to a copper wire of the size just given which would reach from the earth to the sun, back and forth, over fifteen times. In other words, if the electricity depended on escaping from the conductor to zero (or earth) through such insulation, it would have to overcome a resistance of over 1,500,000,000 ohms. Now this resistance of 1,500,000,000 ohms represents the total resistance of the insulation of a wire one mile in length, of which every portion of the insulation is assumed to be lying in direct contact with the earth. If, on the other hand, we imagine that but six inches of the insulation is thus in contact with the earth, as when it might be resting on a roof, the electrical resistance offered to the current would be at that point 15,840,000,000,000 ohms, and since electrical pressure decreases in proportion as it overcomes resistance it is evident that a conductor conveying currents of the highest pressure used in electric lighting, if covered with insulation of such high resistance, might be handled with impunity. Considering certain grades of underwriters' material in the same way and placing the resistance of the same at 1 ohm per mile, which I believe to be high, we would have a resistance of 10,560 ohms for any six inches of its length—a resistance which would be no barrier to the escape in large and increasing quantities of the current from electric light wires.

Proceeding now to my reasons for thinking that the employment of non-insulating material as a covering for the conductors used in electric lighting is in a fair way to be discontinued, and why I think its discontinuance should be hastened, I would state, in the first place, that there is not much doubt that the examples of Chicago, Philadelphia and New York in ordering all electric wires to be placed underground, will be ultimately followed by other cities, and, this being the case, the owners of subways, in order to protect their own property and the property of the users of the subway, will not permit the employment in their conduits of any but a high grade of insulated wire. Already the rules and regulations touching this point, which have been approved by the Board of Electrical Control, New York, are such that a material of high electrical insulation must be employed. For instance, these rules require a resistance of the insulating material covering the conductors carrying electric light currents, of at least 15,000,000 ohms or units of electrical resistance for every 100 units of electrical pressure used in electric lighting. For a current of 2,000 units of electrical pressure this requires a total resistance on the part of the insulation of the underground conductor of 300,000,000 ohms. There is not the slightest difficulty in securing an insulating material to meet these requirements, but underwriters' wire and wire of lower grade of insulation which have been so extensively used in the past for overhead electric light conductors would be, for underground purposes, quite useless.

The first report of the Board of Electrical Control to the Legislature at Albany states, concerning underwriters' wire: "Underwriters' wire is a wire covered with tape saturated with white lead, and a certain length of usage renders it susceptible to moisture. After being in use still longer, the tape rots away and leaves the naked wire exposed."

If underwriters' wire and certain other covered wire used in electric lighting were no worse than this, it would surely be bad enough, but, as a matter of fact, there exists to-day miles of electric light wire of such inferior insulation that during the

first and every subsequent rainstorm encountered the wire is perfectly uninsulated except by the surrounding air. Indeed, the material composing much of this so-called insulation is in reality a fairly good electrical conductor, especially when moist; the term "insulator," as applied to it, being a misnomer, and the use of such inferior insulating material, in view of the admitted fact that electric light conductors, especially aerial conductors, whenever improperly insulated, are very dangerous, both to life and property, must, at least, be considered reprehensible. The employment of such wire, looked at from the point of view of danger to life and property, is indeed much more dangerous than would be the employment of the bare wire, because the former assumes to secure to the public an immunity from the electric current (which, in reality, it does not), and, therefore, it is permitted to be placed in positions where bare wires would not be tolerated, its danger being apparent. In connection with this latter statement it may be mentioned that a certain electrical engineer of this city, in commenting on the injury sustained by a man who had happened to lean on a guy wire which was in communication with an electric light conductor carrying high pressure alternating currents, and the said engineer, desiring to emphasize his argument as to the danger of employing such currents, added: "In this case the insulation of the alternating current wire was apparently perfect. It is not an uncommon thing for telephone and District telegraph apparatus to be burned by their wires coming in contact with the alternating current conductors. Any person who then touches a telephone or call-box runs a terrible risk. This brings the danger home to nearly all of us."

Had it suited the purpose of this engineer to inquire carefully into this matter, he would most probably have discovered that the electric light wire was simply covered, not insulated, with "underwriters'" or a similar non-insulating material, and it would not perhaps be difficult for the users of the alternating current to make this clear in this and similar cases, but that such evidence might show the necessity for a properly insulated and consequently somewhat more expensive wire. As well, however, might railroad bridges be supported on pipe stems or steam boilers be made of tin and then attribute the inevitable accident to a too heavily loaded train, and the resulting explosion to an excess of steam pressure. True, accidents and explosions do occur even when the best material obtainable has been employed in the construction of railroad bridges, and where the strongest material procurable has been used in the construction of boilers. But no one questions that the number of accidents and explosions are greatly lessened by the employment of proper materials.

In many instances the material used in the covering of underwriters' wire is non-inflammable; that is, the covering itself will not ignite should the wire accidentally fall on a roof and originate fire, and this appears to have been considered the desideratum by the underwriters, apparently overlooking the very important fact that fire is, under such conditions, much more likely to be originated by the electric current when the conductor is covered with an inflammable material which is a non-conductor, for the simple reason that so long as the current is unable to pass from the conductor to the earth there will be no undue tendency to the production of heat. If, however, there be any virtue in the use of a non-inflammable covering, such a covering could easily, and at but little additional expense, be placed over a properly insulating material.

In the matter of the use of non-insulated electric light wire, the authorities of New York City have, in the past, been even more lax than those of some other cities. For instance, it is known that covered wire of a certain quality, somewhat extensively

used in New York City, has been rejected as unfit by the underwriters of the adjoining city.

Aside from the increased liability of accident to life and damage to property arising from the employment of poorly insulated electric light conductors, there is another feature of the case which should, and doubtless will, tend to hasten the disuse of such wire, namely this, that in electric lighting every unit of electricity generated by the dynamo machines means the consumption of a certain amount of coal. To keep the lamps up to a standard candle power a certain electrical pressure is required and consequently every unit of electricity escaping to the earth, owing to inferior insulation of the wires or otherwise, is equal to so much waste of coal. Recognizing this fact, and being painfully reminded of it, especially at every recurrence of wet weather, certain wise managers of electric lighting plants are already voluntarily replacing "underwriters'" and weather-proof wire by insulated wire of a higher grade.

The foregoing remarks have referred almost exclusively to the insulation of electric light conductors, for the reason that telegraph companies have for many years past appreciated the value of a good insulation for their conductors and used no other. And it may be cited as showing that durable and reliable insulating material is obtainable, that aerial cables, freely exposed to the elements, in the vicinity of New York, as well as elsewhere, have been in operation for years and are to-day giving unimpaired service.

In my allusions to underwriters' wire, I desire to include all wire of an inferior grade of insulation.

As a possible matter of interest, I may say that I have made at different times during the past four or five years comparative tests of covered wires, and I have found the variation in resistance of the material employed, to range from less than one ohm and 600 ohms per mile in the case of underwriters' and certain weather-proof wire to 600,000,000 and 1,500,000,000 ohms per mile in the case of high-grade insulation, such as the Okonite, the Kerite, the Safety Insulated, Bishop Rubber Compound, etc., all the samples having been tested after immersion in water for several days.

The following are specific results of recent tests of certain insulating materials, which, however, not to be invidious, I shall classify by letters, and will, if desired, furnish the corresponding name of the insulating material subsequently.

These results clearly show, as already intimated, that the low-grade covering does not deserve the name of insulator. In fact, it may be noted that very few of the manufacturers of low-grade covering make any claim for insulation, simply asserting that it is either fire proof or weather proof, or both. If, however, by "fire proof" the meaning intended to be conveyed is that fire will not be originated by the electric current when the conductors are so covered, and by "weather proof" that the covering will not absorb moisture, the statement may be freely made that, in many instances, such covering is neither fire proof nor weather proof.

The insulation resistance of any of the high-grade insulating materials just mentioned, or any equally good insulating material, would far exceed the present requirements of the New York Board of Electrical Control, and the use of such "insulation" as a covering for the aerial electric light conductors in place of the, electrically considered, practically bare conductors, so extensively employed at present, would not only permit the handling of the conductors with comparative safety, in case of necessity, as for instance, during fires, but would also entirely prevent any escape of the

current from the wire to the earth, should the conductor fall on roofs, awnings, etc., until removed therefrom by the repairmen, and thus would undoubtedly largely diminish the almost daily record of accidents and damage to life and property which has been, heretofore, so marked a feature of the prostration of electric light wires, but especially at the recurrence of every severe storm, and which accidents, it is safe to say, in ninety cases out of one hundred, would not occur were the said wires thus properly insulated.

The inferior class of wire herein referred to is manufactured because there is, or has been, a demand for it, and it has been bought because it complied with the underwriters' requirements, where such exist, and especially because it is, at first cost, cheap. When it is fully realized by the public that its continued use for electric lighting purposes is, as it has been in the past, inimical to the public safety; by the underwriters that it is not, in the long run, economical, a knowledge of which facts is fast developing, then, there is no reason to doubt, that it will be entirely superseded by a wire insulated to a point of safety to all concerned.

I would say that I do not by any means claim to hold a monopoly of the views expressed herein as to the dangers accompanying the use of improperly insulated aerial electric light conductors—views which are entertained by probably every electrical engineer in the country, and which have found apt expression in the application of the term "underwriters' wire" to what I have heretofore termed "underwriters' wire."

What I have said heretofore in this letter refers almost exclusively to the dangers arising from and the expense incurred by the use of inferior insulating material as a covering for electric light wires, and I have incidentally pointed out that there need be no particular difficulty in securing a proper insulating material.

My remarks on this subject have referred almost entirely to overhead conductors, in which capacity, apart from durability, the main essentials of an insulating covering are high electrical resistance and impermeability to moisture, and I have attempted to show that the former cannot be secured without the latter.

For underground purposes, however, and especially in large cities, the conditions are materially changed and some additional requirements are set up:

Firstly. There must be guarded against the presence of gases, acids, etc., in underground conduits, due to leakage from gas mains, decompositions in the soils, etc.

Secondly. The high temperature due to the proximity of steam boilers in vaults, the presence of steam pipes in the streets, etc.

As regards the action of gases, it is admitted that it would speedily destroy any of the known materials or compounds possessing high electrical resistance, if such materials should be placed, unprotected, underground.

There are several compounds which, it is claimed, if placed around the insulating material covering the conductors, would render the insulation gas proof, but as yet this claim lacks the test of actual practical experience.

The knowledge of this injurious action of gases upon the insulation of underground wires has, as is well known, conduced to the almost universal employment of lead as an outside covering or protection for the insulating material of such wires. Lead, for this purpose, possesses many advantages peculiar to itself. It is capable

of being placed, when cold, over the insulating material in continuous lengths; it is easily cut for jointing and as easily renewed after jointing; the insulated conductor covered with this metal is flexible, and so long as the lead itself is uninjured it entirely prevents the passage of moisture or water to the enclosed insulating material.

It should be observed that failures of the lead-covered cables were caused by the action of gases upon the lead. This fact necessitated the employment of an alloy of lead and tin, which, so far as I am able to learn, appears to resist the gases encountered in the underground conduits, and consequently lead, with an alloy of about 5 per cent of tin, is now very extensively used for such use. This alloy is a somewhat harder substance than the unalloyed lead, but it still remains sufficiently pliable for practical purposes. Some manufacturers, however, retain the pure leaden envelope and cover it with a braid which, it is claimed, is gas proof.

Having secured, in this metal, an envelope for the insulating covering of the conductor, which is water proof, presumably gas proof, and, to a certain extent, a protection against mechanical injury to the insulation, it may be thought that any material which possesses high electrical resistance can be used for underground purposes. This, however, is not altogether the case, for, in addition to the possibility of an abrasion to the lead envelope, which might admit gas and moisture, there remains to be guarded against, as already stated, the high temperature frequently found in the vicinity of the conduits. Otherwise the choice might lie between Gutta Percha, India Rubber and Gutta Percha compounds and other equally good insulating materials and compounds. But since the temperature of the conduits may be expected to rise much higher than the melting point of gutta percha, which is about 102° F., the use of that material is virtually out of the question for underground purposes in cities, inasmuch as by such softening, the metal conductors, especially the heavy conductors used in electric lighting, would sink to the lead covering, thereby "grounding" the circuits.

In addition to the foregoing mentioned requisites of underground cables, there are others which may ultimately be found to require consideration, but to only one of which I can at present allude, namely, the strain-bearing quality of the insulation under very high electrical pressure, for it has been observed in practice that the latter quality does not depend always upon the specific resistance of the insulating material.

In conclusion, it may be said, however, that it will matter but little what may be the excellence of the insulating material if great care is not exercised in the process of drawing the cable into the conduit to preserve the lead covering and the insulating material intact, and this care will have been wasted if, in addition thereto, caution is not observed in the making of joints at the manholes and elsewhere.

It was recognized 25 or 30 years ago in submarine cable laying that the weak points of cables were the joints, and only the most expert workmen were permitted to make joints. Furthermore, it was demonstrated that some men are physically incompetent to make joints, owing to greasy exudation from the pores, etc. It may be that the same experience is not required in making joints for underground wires or at the junction of the overhead with the underground systems, as in the case of submarine cables, but the necessity for expert workmanship in this respect is made manifest when it is stated that in more than one instance the work of several supposed skilful jointers has had to be entirely undone and then done over by expert jointers, in order to bring certain cables up to a required state of insulation. And the further need of expert and moderately intelligent workmen in joint making, especially indeed in the case of lead-covered cables, will be apparent when the fact is announced that

more than one workman has, in making joints in such cables, permitted the conductor to come into contact with the lead covering, thereby grounding the circuit, the excuse in each case being ignorance of the fact that the lead went to "ground."

Yours respectfully,

WM. MAVER, JR.,

Member American Institute Electrical Engineers, Ex-Electrician Baltimore and Ohio Telegraph Co., etc.

The following Report of Electrical Expert Wheeler was, upon motion of Commissioner Gibbens, ordered to be spread upon the minutes:

REPORT OF ELECTRICAL EXPERT.

Detail of all Notices of Violations of Rules & Regulations sent from March 16th to April 15th, 1889, inclusive.

	No. of V's	No. of N's S't	S'cnd Notices Notices Answ'd	Notices Att'd to	Notices S't to B. of I.
U. S. Co.—Dead Poles.....	1	1			
Man. Co.—Dead Poles.....	9	1			
Ball E. L. Co.—Dead W's.....	1				1
W. U. T. Co.—U's P. L's.....	1	1			
Fire D't—Dead P's.....	1	1			
Ow'r U'n—Dead W's.....	64			17	51
Dead P's	21			3	6
	—			—	—
	85			20	57
	—			—	—
Total.....	98	4		20	58

Work done by Bureau of Incumbrances during same period.

Removed 37 poles and 449,070 feet of wire.

Commissioner Gibbens offered the following resolution:

Resolved, That the permit issued by the Secretary to the Metropolitan Telephone and Telegraph Company to erect four poles in 124th street, near Ninth avenue, to replace four poles destroyed by fire, be approved.

Unanimously adopted.

Resolved, That the applications of the Western Union Telegraph Company now before the Board be referred back to that Company, with a letter from the Secretary that this Board will not consider any applications of the Western Union Telegraph Company until such time as it shall take down its wires along the Elevated Road.

Unanimously adopted.

Mayor Grant: Have a form of letter to the Western Union Telegraph Company ready to-morrow.

Mayor Grant offered the following resolution:

Resolved, That the Board adjourn until Thursday, April 25th, 1889, at 11 o'clock A. M.

Unanimously adopted.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, April 25th, 1889, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

The reading of the minutes of the last meeting was laid aside.

Mayor Grant called on Expert Wheeler to make his report upon the matter referred to him at the last meeting.

Expert Wheeler reported in reference to the information as to certain companies violating the rules and regulations of the Board, submitted to him at the last meeting for investigation and report, that he had examined into the charges contained in the information and had found that each of the companies named, to wit, the Brush Electric Illuminating Company, the East River Electric Light Company, the Manhattan Electric Light Company, the Mount Morris Electric Light Company and the Harlem Lighting Company, had violated, at least in some particular, the rules and regulations.

Commissioner Gibbens offered the following resolutions:

Resolved, That a permit be granted to Hon. William R. Stewart, Chairman of one of the Committees on the Centennial Celebration, to light the arch in Fifth avenue at Washington Square, from his battery, for the space of ten days.

Unanimously adopted.

Resolved, That a committee be appointed by the Chair, to consist of one member of the Board, the Chairman of the Board, Mr. McCormick, of the Lamps and Gas Department, and that the committee be directed to issue ten-day permits for overhead wires to light the parks, public places, etc., during the Centennial time—preference to be given where it can be given to the United States Illuminating Company.

(Amended.)

Mayor Grant moved to amend the resolution offered by Commissioner Gibbens, so as to make it read as follows:

Resolved, That a committee be appointed by the Chair, to consist of one member of the Board, the Chairman of the Board, Mr. McCormick, of the Lamps and Gas Department, and that the committee be directed to issue to the United States Illuminating Company ten-day permits for overhead wires to light the parks, public places, etc., during the Centennial time.

Commissioner Gibbens: I accept the amendment.

The amended resolution of Mayor Grant was unanimously adopted.

Mayor Grant: I appoint Commissioner Gibbens.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to send to the President of the Western Union Telegraph Company all its applications for overhead wires, with the following letter:

To the President of the Western Union Telegraph Company:

SIR:—I am directed to return herewith your Company's applications for overhead wires and inform you that the Board of Electrical Control will decline to consider any such application until such time as you shall see fit to carry out your agreement made with the Board when you were permitted to place cables upon the structures of the Elevated Railroad; to wit, that you would remove your poles and wires from along the streets occupied by said structures. Connections with the elevated structures have been made for you underground wherever you have signified a desire for the same, and, in view of that fact, you are not prevented from using these structures freely for carrying your conductors, there seems to be no good reasons why you should not make good your pledge as above stated.

The fact that your neglect to carry out this pledge of yours has compelled the expenditure of considerable money by the Department of Public Works to remove poles and wires, which should properly have been removed by your Company, seems to necessitate some action by the Board of Electrical Control to insure against further loss to the City in this direction.

Very respectfully,

THEODORE MOSS, Secretary.

Unanimously adopted.

Commissioner Gibbens moved the following resolution:

Resolved, That permission be granted to the Metropolitan Telephone and Telegraph Company to connect its cable at the Western Union Telegraph Company's office, at 23d street and Fifth avenue, with the two blocks occupied by the Fifth Avenue and Hoffman Hotels.

Commissioner Gibbens stated, in connection with his motion, that the Metropoli-

tan Company, having acted upon such a permission, would be enabled to take down its line of poles through 23d street, from Broadway to Sixth avenue, at which point there is no subway for telephone and telegraph conductors.

Mayor Grant thought the two blocks should be connected through adjacent existing subways, and, after some discussion, he offered the following resolution:

Resolved, That the resolution of Commissioner Gibbens that permission be granted to the Metropolitan Telephone and Telegraph Company to connect its cable at the Western Union Telegraph Company's office, at 23d street and Fifth avenue, with the two blocks occupied by the Fifth Avenue and Hoffman Hotels, be laid over.

Unanimously adopted.

The following communication was read:

CARTER, HUGHES & CRAVATH,
ATTORNEYS AND COUNSELLORS AT LAW, 346 BROADWAY,
NEW YORK, April 20th, 1889.

HON. HUGH J. GRANT, Mayor, &c.:

DEAR SIR:—I take the liberty of repeating in writing the application which was made to you orally this morning in behalf of the United States Illuminating Company, so that the character of our application cannot be misunderstood.

The United States Illuminating Company requests of the Board of Electrical Control permission to place temporarily eight wires on its own poles on Fourth avenue, from Thirtieth street to Twenty-seventh street, and on the Brush poles on Twenty-seventh street, from Fourth Avenue to Fifth avenue. This will enable our Company to supply its customers, the Hotel Brunswick, Delmonico's, the Victoria Hotel, the Gilsey House and the Sturtevant House, with electric lights during the Centennial week, which is about to follow. We will have our underground connections on Broadway completed within three weeks, or possibly within two weeks, when the wires for which we now ask permission can be removed permanently. I remain,

Yours very respectfully,

PAUL D. CRAVATH.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the United States Illuminating Company, dated April 23d, 1889, to place six wires on its own poles on Fourth avenue, from 27th to 30th streets, and six wires on Brush poles on 27th street, from Fourth avenue to the west side of Fifth avenue, be referred to the committee appointed by the resolution passed at this meeting directing the issuance of ten-day permits during Centennial time.

Unanimously adopted.

The following application was read:

NEW YORK, April 23, 1889.

HONORABLE THEODORE MOSS, Secretary Board of Electrical Control, 1218 Broadway, City:

DEAR SIR:—We respectfully make application herewith for permission to remove our wires from the pole near the northwest corner of Union Square and 14th street, and transfer the same to the United States Illuminating Company's pole on the southwest corner of 14th street and Union Square. This will enable us to take down the pole we now occupy. The Brush Company also have wires on the pole in common with us and join in this application.

As you are aware, this pole is in an unsafe condition; the wires north thereof having been cut down, it has a tendency to lean, and in a gale of wind, if not properly supported, would undoubtedly topple over. I trust your Honorable Board will be kind enough to grant this application, with the full understanding that as soon as the contemplated subway on 14th street shall have been completed, we will remove all the overhead wires. The United States Illuminating Company give consent to occupy their pole.

Yours respectfully,

THE MANHATTAN ELECTRIC LIGHT CO. (LIMITED).

Mayor Grant offered the following resolution:

Resolved, That the application of the Manhattan Electric Light Company, dated April 23d, 1889, to remove its wires from the pole near the northwest corner of Union Square and 14th street, and transfer the same to the United States Illuminating Company's pole on the southwest corner of 14th street and Union Square and to take down the first named pole be referred to the Electrical Expert for report.

Unanimously adopted.

Commissioner Gibbens stated that the Board had before it a number of applications from the various electrical companies, for connections, etc., in districts where there are no subways, and offered the following resolution:

Resolved, That all applications before the Board, for connections, etc., in districts where there are no subways, be laid over until the next meeting.

Unanimously adopted.

Expert Wheeler reported as follows on the application of the Manhattan Electric Light Company referred to him at this meeting:

"The pole on the north side of 14th street referred to is in a very unsafe condition. It would be an improvement to remove the wires on it to the poles on the south side of the street.

Very respectfully,

"S. S. WHEELER."

Mayor Grant offered the following resolution:

Resolved, That the application of the Manhattan Electric Light Company, dated April 23d, 1889, to remove its wires from the pole near the northwest corner of Union Square and 14th street and transfer the same to the United States Illuminating Company's pole on the southwest corner of 14th street and Union Square, and to take down the first named pole, be granted; the work to be done under the supervision of the Electrical Expert and the Engineer of the Board of Electrical Control.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Tuesday, May 28th, 1889, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read and approved.

The following report was, on motion of Commissioner Gibbens, ordered to be spread on the minutes:

Report of Electrical Expert on Poles and Wires removed since 1st of January, 1889, to the 15th day of May, 1889:

By Companies.	Poles.	Miles of Wire.
Met. Tel & Tel. Co.....	82	100
W. U. Tel. Co.....	246	403.49
Fire Department	170	40
U. S. Ill. Co.....	115	23
Brush Ill. Co.....	56	54.10
Harlem E. L. Co.....	134	
Total	803	620.59
By Bureau of Incumbrances.....	879	520
Grand Total	1,682	1,140.59

The following report of Expert Wheeler was read:

NEW YORK, May 28th, 1889.

To the Board of Electrical Control:

GENTLEMEN:—The following are locations in which the East River Electric Light Company maintain lines of wires on both sides of the street:

First avenue, from 24th to 38th streets.

The Bowery, from 6th street to Chatham Square, thence on Chatham street and Park Row to Broadway.

The wires on the west side of First avenue are strung upon the poles of the Metropolitan Telephone Company, and should be transferred to the line of electric light poles on the east side.

S. S. WHEELER, Electrical Expert to the Board.

The following report of Expert Wheeler was also read:

NEW YORK, May 28th, 1889.

To the Board of Electrical Control:

GENTLEMEN:—The following are localities in which the Western Union Telegraph Company maintains a line of poles and wires on each side of the street:

Eleventh avenue, from 51st to 42d streets;
Tenth avenue, from 37th to 16th streets;
Washington street from Gansevoort street to Dey streets;
Church street, from Canal to Rector streets;
Greene street, from Waverly Place to Bleecker street;
William street, from Cedar to Beaver streets;
John street, from Cliff to Front streets;
Park Row, from Beekman to Frankfort streets;
Beaver street, from Broad to New streets.

Very respectfully,

S. S. WHEELER, Electrical Expert to the Board.

Commissioner Gibbens offered the following resolution:

Resolved, That the removals suggested by the two reports of Expert Wheeler, dated respectively May 28, 1889, read at this meeting, referring, the one, to lines of the East River Electric Light Company, and the other, to lines of the Western Union Telegraph Company, be directed.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That Expert Wheeler be directed to make investigation and report as to whether or not any of the streets or avenues mentioned in his two reports read to the Board at this meeting, dated respectively May 28, 1889, are localities in which there are subways.

Unanimously adopted.

The following communication was read:

[MAY 28, 1889.]

EXECUTIVE OFFICE,
WESTERN UNION TELEGRAPH COMPANY,
NEW YORK, April 27, 1889.

THEODORE MOSS, ESQ., Secretary Board of Electrical Control, New York City:

SIR:—Your letter of April 25th has been received.

Permit me to suggest that the Board of Electrical Control in declining to consider any application of this company for overhead connections, upon the ground that it has failed to carry out its agreement with the Board relative to the removal of poles and wires upon streets occupied by the elevated roads, is laboring under a serious misapprehension of facts.

The only communication from this company that can be construed as an agreement such as your letter suggests, is contained in my letter of November 1st, 1886, in which application is made for permission to string one hundred (100) insulated wires upon the Third avenue structure of the Manhattan Railroad Company, and in which the statement is made that the purpose of the application is to give the Western Union Telegraph Company such facilities as will enable it to remove its poles along that route. In accordance with the said purpose of the application, this company has removed all its poles on the east side, on Third avenue, from 55th to 110th streets.

There remains standing upon that avenue only a line of poles between 5th and 58th streets, and from this line the Company some time ago removed all its wires, with the exception of one or two, which it is ready to remove at any time, but which it was more convenient to retain there until the fire and police wires should be removed therefrom.

This company has notified both the Fire and Police Departments to remove their wires from these poles, but they have failed to do so, and the poles are retained there simply to sustain their wires.

We are willing and ready to remove the poles as soon as the fire and police wires are removed therefrom, or we will waive and renounce all rights to those poles, leaving them to be taken down by the Department of Public Works without delay, if that Department is willing to assume the responsibility of depriving the Fire and Police Departments of the use of the poles for carrying their wires.

I beg further to say that this company has also removed a line of poles on Ninth avenue, from 17th to 55th streets, and stands ready, and is willing, to remove the other line as far north as 125th street, provided it can obtain from your Board the necessary authorization to connect its several offices on the West Side of the city to the cable strung upon the Ninth avenue elevated structure. It was to enable it to do this that three of the applications were made, which were returned by your Board, and referred to in your letter of April 25th.

These applications, I beg further to suggest, are all outside of the subway district.

Yours truly,

THOMAS T. ECKERT, Acting President.

Commissioner Gibbens: In reference to this letter, which is virtually an excuse of the Western Union Telegraph Company for not complying with the agreement it made with the Board when allowed to place its wires on the elevated roads, the only thing it seems necessary for me to say is, while, perhaps, there are no communications on file in our office to the effect that it would remove its poles and wires along the line of the elevated road, the principal stockholder, Mr. Gould, told Mr. Hess and myself over and over again—the Commissioner remembers it—that that would be done. And what has been done? They have taken down a few wires along the line of the elevated road, and the city is paying for taking down their poles and wires. I do not consider this satisfactory, and I think the Board should continue to decline to grant or look at any application of the Western Union Telegraph Company until it makes a satisfactory arrangement to carry out that agreement.

Mayor Grant offered the following resolution:

Resolved, That the matter of the communication of the Western Union Telegraph Company, dated April 27, 1889, and read at this meeting, be referred to Expert Wheeler, to report on at the next meeting.

Unanimously adopted.

Mayor Grant stated to the Board that he had written to the Fire Department and also to Commissioner Purroy in reference to the getting of the Fire Department wires underground.

Commissioner Gibbens: Now, Mr. Chairman, I want to call your attention to the fact that there is a dispute between the Western Union Telegraph Company and the Board of Electrical Control, regarding a line of poles on Tenth avenue, and partially on West street, which is really Tenth avenue; that is to say, under a different name. In connection with this matter affidavits are made by the Western Union Telegraph Company, to the effect that its line of poles in that street have been in active operation for several years. In answer to that an affidavit was made by an Inspector of the Board, to the effect that he had examined those poles along the street, and he knew the poles were "dead" poles. It was on that report notice was sent to the Department of Public Works. The Commissioner of Public Works has sent the Board a letter in which he states that the decision of this Board will be final with him. These poles are all stripped of wires. They are in a dangerous condition, so dangerous that the contractor told me he had to guy them up. And the Western Union Company has got a parallel line along Ninth avenue, got a parallel line along Tenth avenue for quite a distance right parallel with this other line of poles, and it has been allowed to use the elevated road; and it has also got a line on Eleventh avenue. I move the Secretary be directed to communicate with the Department of Public Works and request the Commissioner to take them down at once.

Mr. Humstone, Superintendent of the Western Union Telegraph Company: Will

I be allowed to say a word about the situation on Tenth avenue? Mr. Gibbens has stated the case correctly. His Inspector has reported them as "dead." They have been working steadily for twenty-five or thirty years. Those poles carry two wires of the Pennsylvania Railroad Company, one of which is used as a fire line wire, and protects their interests. They carry one wire for the New York Central Railroad, and one for the Erie Road. In addition to that they carry five wires for the Western Union Telegraph Company's service. The unwarranted cutting of those poles has deprived our 23d street—our 410 23d street office—of wires entirely. It has largely depleted the facilities of the 65th street and Eleventh avenue offices. We have submitted affidavits, of our foreman and wire chief to Commissioner Gibbens that they were "live." We have also submitted to the Department of Public Works, at Mr. Gibbens' suggestion, the affidavits of the Pennsylvania Railroad employees that they were "live." It is very necessary for our business that we be allowed to restore this connection.

Commissioner Gibbens: Well, suppose you were allowed to run your wires from the elevated road to this place or along a parallel route?

Mr. Humstone: There is no line of poles along the street below this point. Above the point I have received notice from the Mayor to take down one of those poles, and have taken down, except those poles occupied by the East River Electric Light Company. I cannot take down the electric light wires.

Mayor Grant: The poles are ours.

Commissioner Hess: You have abandoned them.

Mr. Humstone: I have notified the East River Electric Light Company to take down those poles.

Commissioner Gibbens: You own a structure in the city of New York which you have a right to have on the streets of the city as long as you need it. You do not need those poles; they have got the wires of another company—another, not your company.

Commissioner Moss: Without your permission?

Mr. Humstone: They are there by our permission.

Expert Wheeler: I am directed to ask you, if in a number of cases where there are wires of one line of poles on a street, used for signaling purposes, whether you can co-operate with the other companies in cutting out one line of poles. For example, on Seventh avenue; can you consolidate your line with the Telephone Company line between 51st and 11th streets? You have a small line of poles there.

Mr. Humstone: I cannot say without looking at the lines and without knowing whether the Telephone Company would grant us permission there.

Expert Wheeler: The Board has written you letters upon that subject.

Mayor Grant, to Mr. Cutler, of the Telephone Company: Will you consent to the transfer of these wires on your poles?

Mr. Cutler: We will consent where the poles are heavy enough. I cannot say about this particular case.

Expert Wheeler: When they were written to about this, each company said it would do it if the other company would bear the expense.

Commissioner Hess: Making the change.

Mayor Grant: What about that now?

Mr. Cutler: We could not be expected to remove the wires of the Western Union Telegraph Company.

Expert Wheeler mentioned several other localities where consolidation was desirable, and, after some further discussion, Commissioner Gibbens offered the following resolution:

Resolved, That, in the matter of consolidation of lines used for signaling purposes in localities where such lines are duplicate, Expert Wheeler be directed to confer with the companies owning such lines with a view to such consolidation.

Unanimously adopted.

Commissioner Gibbens: In regard to this Tenth avenue line, there is no question but that the Western Union Telegraph Company have got poles, or the elevated road, or something they can operate as well as that Tenth avenue line, if it is really a "live" line.

Mr. Humstone: There is no doubt about the line being "alive." We have on Eighth and Ninth avenues poles and wires which supply sixteen offices on the West Side of the city.

Commissioner Gibbens: Where is your list of your connections with the Ninth Avenue Elevated Road?

Mr. Humstone: We will have it at the next meeting of the Board. If we can get the permission to make the connection we can take down the poles.

Mayor Grant: If your companies and the other companies show a disposition to help this Board to get the wires underground, you will find we are just as agreeable to you as you are to us in helping us.

Mr. Humstone: The Western Union Company is ready and willing to assume that position.

Mayor Grant: I have not believed it before, but I hope it will be so in the future.

Commissioner Gibbens offered the following resolution:

Resolved, That the Board of Electrical Control request the Corporation Counsel of the city of New York to act as its counsel.

Unanimously adopted.

Commissioner Gibbens also moved the following resolution:

Resolved, That, provided the Corporation Counsel consents to act as Counsel for the Board, the case of the American Rapid Telegraph Company against Jacob Hess and others be referred to him.

Unanimously adopted.

Mayor Grant: Here are a lot of applications from the Metropolitan Telephone and Telegraph Company, outside of the subway district, as Mr. Wheeler informs me. Are they?

Expert Wheeler: Yes, sir.

Mayor Grant: The Secretary will read them off, and as they are read the question will be put.

A number of these applications having been read, and it appearing that several of them were for connections in the subway district,

Mayor Grant offered the following resolution:

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company now before the Board be referred back to the Expert, to be carefully examined, and reported upon at a meeting to-morrow.

Unanimously adopted.

Commissioner Gibbens: Specifications from the Police Department for wires underground have been sent up to our office, and I presume they are waiting to get some approval before doing anything. I think the Secretary had better address a letter to the President of the Police Board. It seems these specifications are all right, and he had better get his cables as soon as possible.

Mayor Grant: I do not propose to approve those specifications. You say those are all right, Mr. Wheeler?

Expert Wheeler: No, sir.

Mayor Grant: You had better let Mr. Wheeler read them.

Mayor Grant offered the following resolution:

Resolved, That the Board adjourn to Wednesday, May 29th, 1889, at 11 o'clock, A. M.

Unanimously adopted.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, May 29, 1889, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel L. Gibbens, Theodore Moss.

The reading of the minutes of the last meeting was dispensed with.

The Board thereupon took up the consideration of applications for permits in districts where there are no subways.

Mayor Grant offered the following resolution:

Resolved, That the following applications of the Metropolitan Telephone and Telegraph Company, to wit,

To run a wire from 50 Wall street to 49 Wall street,
40 Wall street to 45 Wall street,
36 Wall street to 58 William street,
68 Wall street to 54 Wall street,
68 Wall street to 102 Wall street,
173 Washington street to corner of Greenwich and Vandam streets.
233 East 38th street to 422 East 48th street,
135 Duane street to 463 Washington street,
Pier 39, North River, to 13th avenue and 11th street,
Pier 46, North River, to Pier 37, North River,
1258 Third avenue to 1242 Third avenue,
22 State street to our underground terminal, Kemble Building,
141 Pearl street to 53 Beaver street,
111 Nassau street to 108 Liberty street,
33 Wall street to 35 Broad street,
1447 Third avenue to 1441 Third avenue,
105 West street to 85 West street,
9 Nassau street to 7 Pine street,
73d street and Ninth avenue to 1170 Ninth avenue,
63 Pine street to 58 William street,
Pier 45, North River, to Pier 44, North River,
37 Wall street to 44 Wall street,
74 Irving place to 57 Irving place,
66 West 35th street to 64 West 36th street,
599 Ninth avenue to 671 Ninth avenue,
33 Wall street to 24 Pine street,
20 Cedar street to 178 Front street,
66 Centre street to 80 Beekman street,
737 Madison avenue to 2 East 78th street,

50 Exchange place to 46 Wall street,
 15 William street to underground terminal at 43 Broad street,
 9 Nassau street to 7 Pine street,
 132 East 125th street to 1294 West 142d street,
 Pier 46, North River, to Pier 25, North River.
 58th street and 8th avenue to 1170 Ninth avenue,
 58th street and 8th avenue to 1599 Ninth avenue,
 107 West street to 90 West street,
 164 West 27th street to 529-541 West 23d street,
 132 East 125th street to 262 West 125th street,
 21 wires from Bronx River to Vyse avenue, to complete line to Boston, Mass.,
 2 wires from 42d street and Lexington avenue to Grand Central Depot,
 1 wire from 21st street and Sixth avenue, being the terminal of subway, running
 west on 21st street, thence on pole line
 to Eleventh avenue, south on Eleventh avenue to 15th street,
 be granted.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be authorized to grant a permit to the Metropolitan Telephone and Telegraph Company to stretch a wire and make connection to the residence of the Doctor of the House of Refuge; also to stretch a wire and make connection to the residence of the Superintendent of the Street Cleaning Department; provided, however, that no such overhead connection shall be made in a street having a subway.

Unanimously adopted.

Commissioner Hess offered the following resolution:

Resolved, That the Secretary be authorized to grant a permit to the Metropolitan Telephone and Telegraph Company to make telephonic connection to the residence of Dr. Bryant, of the Health Department; provided, however, that no wire shall be strung in a street where there is a subway.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That the applications of the Harlem Lighting Company to make house connections with existing lines as follows:

Ehler H. Ernest, 2252 Second avenue;
 H. U. Singhi, 2039 Third avenue;
 Gausmos, Deaves and Stadelberger, 2286 Third avenue;
 H. Edelstein, 1519 Third avenue;

H. Weissman, 1533 Third avenue;
 August & Minzie, 2284 Third avenue;
 H. Gruhn, 2327 Third avenue;
 J. Lewis, 2400 Third avenue;
 Jacobs, Peters & Knapp, 1980 Third avenue;
 Henry Vogel, 2258 Third avenue;
 N. Sulzberger, 1912 Third avenue;
 Perkins & Harrin, 2401 Third avenue;
 Henry Vogel, 2263 and 2265 Third avenue;
 L. Littauer, 1493 Third avenue;
 L. S. Stoich & Co., 2245 Third avenue;
 Dreisacker & Co., 2287 Third avenue,

be granted.

Unanimously adopted.

Resolved, That the applications of the Manhattan Electric Light Company, Limited, to connect existing lines as follows, with

140 Fifth avenue,	91st street and Third avenue,
329 Grand street,	68 Bowery,
494 Broadway,	227 Bowery,
825 Broadway,	191 Bowery,
713 Broadway,	13th street and Broadway,
735 Broadway,	1432 Third avenue,
353 Broadway,	1470 Third avenue.
601 Broadway,	258 E. 23d street.
428 Broadway,	246 Grand street,
428 Broadway,	202 Grand street,
323 Broadway,	474 Grand street,
411 Broadway,	484 Grand street,
409 Broadway,	129 Grand street.
343 Broadway,	280 and 260 Grand street,
223 First avenue,	448 Grand street,
44th street, between 1st avenue and E. R.	326 Grand street,
and 44th street East of 1st avenue.	42 Fourth avenue,
Third avenue and 90th street,	8 Union square,
23d street and Eighth avenue,	

be granted.

Unanimously adopted.

Resolved, That the applications of the United States Illuminating Company to make connections with circuits as follows: with

Washington street, 298, 258, 267, 321, 230, 251, 427, 267;
West street, 161, 251, 154, 150, 102, 171, 152;
Gansevoort and West;
College place, 30;
William street, 23;
Fulton street, 210, 120, 121;
Fulton street, corner of Nassau;
Bleecker, 173;
Whitehall, foot of;
Vesey, 98;
Chatham square, 6;
Park place, 94 and 10;
Park Row, 132;
Liberty and Church streets;
Church street, 26 and 330;
Broome and Forsyth streets;
Bowery, 170, 168, 187, 140, 202, 80, 14, 27, 158, 40, 86, 1, 42;
Canal and Bowery;
Cortlandt street, 45, 49;
Third avenue, 1287;
New street, 73;
Delancey street, 105;
East Houston street, 290, 338;
Essex street, 77, 79, 151;
Broadway, 534, 673, 187, 768, 379, 291, 535, 532, 74, 78;
Broadway and Bleecker street;
Avenue A and 69th street;
Abingdon square, 3;
Avenue B and Houston street;
Eighth avenue, 410, 531, 429, 117, 629, 417, 801;
Reade street, 178, 186;
Dey street, 61;
Avenue B, 85, 61, 105, 60;
Rivington street, 54;
Duane street, 206;
Hudson street, 514;
Beaver street, 19;
Grand street, 518, 392, 470, 397, 276, 405, 535, 337, 373, 354, 237;
Reade street, 185, 187, 181;
Little 12th street, 68, 53;
Christopher and West streets;
Catharine street, 49;
42d street, 152 E., 154 E.;

Avenue A, 70;
14th street and Broadway;
30th street, 31 E., 32 W., 31-33 W.;
Fourth street, 57 E., 56 E., 5-7 E.;
58th street, 159 E.;
Barclay street, 8, 94;
Murray street, 98;
Third avenue, 944, 748, 780, 501, 668;
Canal street, 220,

be granted.

Unanimously adopted.

Resolved, That the application of J. Lichtenstein & Sons, dated May 7th, 1889, to add four electric lights to the seven now lighted by them from their own plant in front of premises Nos. 281-287 Grand street, be granted.

Unanimously adopted.

Resolved, That the applications of the East River Electric Light Company to connect wires to circuits at the following places:

Fourth avenue, 459, 118, 12;
Bowery, 359, 222;
Second avenue, 1083, 113;
Grand street, 459;
Avenue B, 301, 105;
Third avenue, 147, 195, 46, 73, 27;
Irving place and 18th street;
Tenth street, 225 E.;
Fifth avenue, 136;
9th street, 88, 113 E.;
17th street, 139 E.;
First avenue, 844;
44th street and First avenue;
Avenue A, 25;
Centre street, 48;
Allen and Delancey streets;
Avenue C, 10;
Second street, 312 E.,

be granted.

Unanimously adopted.

Resolved, That the applications of the Brush Electric Illuminating Company to make connections with its circuits at the following places:

Eighth avenue, 137, 167, 654, 335, 457, 669, 687, 263;
Fourth avenue, 347, 12;
Grand street, 323, 457, 377, 373;
Eighth avenue, 351;
Broadway, 335, 258, 187, 643, 611, 853;
Bowery, 132, 82, 14, 256;
Third avenue, 272;
Avenue A, 9;
Spring street, 51;
Seventh avenue, 324;
13th street, 52 E., 104 E.;
Canal, 264,

be granted.

Unanimously adopted.

Resolved, That the applications of the Mount Morris Electric Light Company to make connections with its circuits at the following places:

West street, 150, 153, 154, 161, 164, 176, 272, 355;
Washington street, 228, 281, 303, 331, 258, 285, 308, 266, 298, 320;
Greenwich street, 320, 326;
Greenwich street, corner of Dey street;
Hudson street, 361;
Bowling Green, 1 to 7;
Dey street, 74;
Barclay street, 8, 99;
Park Place, 94, 97, 100, 104, 105;
Murray street, 87, 89, 90, 95, 108;
Warren street, 62, 107;
Jay street, 32;
Reade street, 175, 178, 179, 185, 187;
Duane street, 206, 209;
Canal street, corner of Thompson;
Ninth avenue, corner of 47th street;
Ninth avenue, corner of 60th street;
Ninth avenue, 305, 358, 681, 890, 893, 1402;
Tenth avenue, corner of 174th street;
125th street, 332 West;
125th street, corner of Eighth avenue;

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135th street, corner of 9th avenue;
Hudson and 14th streets,

be granted.

Unanimously adopted.

Resolved, That the applications of the North New York Lighting Company to connect lamps with its circuits at the following places:

Third avenue, 2658, 2445, 2619, 2689, 2575, 2999, 3477, 3483, 2756, 2643, 3047,
2521, 2418, 2449, 2471, 3544, 2611, 2840, 2607, 2995, 2551, 2426, 2490, 3690, 2607, 3125;

Alexander avenue, 235, 368;

Lincoln avenue 163, 168, 159;

Mott street, 225;

161st street and Third avenue;

168th street and Third avenue;

133d street, 482, 486, 503,

be granted.

Unanimously adopted.

Resolved, That the Secretary be directed to request the Consolidated Telegraph and Electrical Subway Company to inform the Board of its rates of charges for the use of its subways.

Unanimously adopted.

Expert Wheeler made the following report:

NEW YORK, May 29, 1889.

To the Board of Electrical Control:

GENTLEMEN:—The following are localities in which the Western Union Telegraph Company maintains a line of poles and wires on each side of the street:

Eleventh avenue, from 51st to 42d streets;
Tenth avenue, from 37th to 16th streets;
Washington street, from Gansevoort to Dey streets;
Church street, from Canal to Barclay streets;
Greene street, from Waverly place to Bleeker street;
Broad street, from Wall to Exchange place;
William street, from Cedar to Exchange place;
Beaver street, from Broad to New streets;

Very respectfully,

S. S. WHEELER, Electrical Expert to the Board.

Mayor Grant offered the following resolution:

Resolved, That the Western Union Telegraph Company be directed to take down one of its lines of poles and wires in each of the following localities:

Eleventh avenue, from 51st to 42d streets;
Tenth avenue, from 37th to 16th streets;
Washington street, from Gansevoort to Dey streets;
Church street, from Canal to Barclay streets;
Greene street, from Waverly Place to Bleecker street;
Broad street, from Wall to Exchange place;
William street, from Cedar to Exchange place;
Beaver street, from Broad to New streets,

and transfer the wires thereof to the pole line on the other side of the street.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated April 23d, 1889, to erect on south side of 21st street one hundred feet west of Sixth avenue, a pole to replace the one now standing at same point, which is useless for underground terminal, be granted.

Unanimously adopted.

Commissioner Moss offered the following resolution:

Resolved, That the application of the Mount Morris Electric Light Company, dated May 16, 1889, to erect one pole on Vandam street, near Greenwich street, to connect its new station with its main lines on Greenwich street; also, to put cross-arms and wires upon the same and upon three poles already erected upon Vandam street for the same purpose, be granted.

Unanimously adopted.

Commissioner Gibbens offered the following resolutions:

Resolved, That the application of the United States Illuminating Company, dated April 23d, 1889, to place one new pole in place of old one near the southeast corner of Fourth avenue and 23d street, to be used to make connections with the subways, be granted.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated April 23, 1889, to erect a new pole in place of an old one on Sixth avenue, near the southwest corner of 18th street, to be used to make connections with subways, be granted.

Unanimously adopted.

Resolved, That the Secretary be directed to put at the bottom of every permit he issues the words, "This is for a house or lamp connection only."

Unanimously adopted.

Resolved, That the Secretary be directed to communicate with the Department of Public Works and state that the report made to the Department regarding the Tenth avenue pole line is confirmed, that the line is not necessary to the business of the Company, and should be removed.

(Withdrawn.)

Resolved, That the opinion of the Corporation Counsel be requested as to the case where telegraph or telephone poles have become unnecessary to the business of those companies, and are "dead" as far as the business of those companies is concerned, but where electric light wires have been placed upon these telegraph or telephone poles, whether the fact that the company has allowed the electric light company to place its wires on its poles give those poles any longer lease of life than they would otherwise have.

Unanimously adopted.

Resolved, That the Secretary be directed to send a letter to John M. Toucey, General Superintendent of the New York Central and Hudson River Railroad Company, and thank Mr. Toucey for his courtesy in allowing the Fire Department to use the tunnel to carry its wires.

Unanimously adopted.

Commissioner Moss moved the following resolution:

Resolved, That the Board adjourn.

Unanimously adopted.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, June 13th, 1889, at 12 o'clock M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

The reading of the minutes of the last meeting was dispensed with.

The following communication of the Manhattan Electric Light Company was presented to the Board by Mayor Grant, and read:

NEW YORK, June 8, 1889.

HON. HUGH J. GRANT, President Board of Electrical Control, 1266 Broadway, City:

DEAR SIR:—Being anxious to develop our business, and to utilize our large and expensive plant, we respectfully request that your Construction Co., the Consolidated Telegraph and Electrical Subway Company, be directed to build subways, and to complete them before the 15th of July, in the following streets and avenues:

42d and 57th streets, from First avenue to Broadway,
59th street, from 5th avenue to Broadway,
5th avenue, east and west sides, from 42d to 86th Sts.

In this connection we beg to state that we shall need the subway in 29th street, from First avenue to the west side of the city, which was ordered by your Honorable Board, so as to be able to remove our poles and wires from 28th street.

These are but a few of the subways which we need for the development of our business.

On the 15th of May we requested the Subway Co. to build subways for us, in streets and avenues, in addition to those above enumerated, as follows:

Madison avenue, 57th to 86th streets,
Fourth avenue, 57th to 86th streets, and
Fifth avenue, from 14th to 42d streets.

We should be exceedingly gratified if subways would be provided in all these streets and avenues, especially in those first above enumerated, namely:

42d street and 57th street, from First avenue to Broadway,
59th street, from Fifth avenue to Broadway,
Fifth avenue, east and west sides, from 42d to 86th sts.

It is absolutely necessary that these subways should be provided immediately, on or before the 15th day of July. There are at present no subway facilities from the east to the west side of the city, and we need them in the streets enumerated, 42d and 57th streets, in addition to 14th and 29th streets, where they have already been ordered by your Honorable Board. At the present time, in order to use the subways at 58th street and Sixth avenue, where we are at present supplying light, we are obliged to take the following course: Down First avenue to 28th street; thence across to the Sixth avenue subway, and up in the Sixth avenue subway to 58th street again.

In this connection we beg to state that we have notified the Subway Co., as long

ago as the early part of February, of our needs in these matters, at which time a map of our proposed work was submitted to the Company, but since that time, to our knowledge, no steps have been taken. We sincerely trust that your Honorable Board will direct that subways be built for us, in all these streets and avenues, especially:

42d and 57th streets, from First avenue to Broadway,
59th street, from Fifth avenue to Broadway,
Fifth avenue, east and west sides, from 42d to 86th sts.

Very respectfully,

E. A. LESLIE, General Manager.

Commissioner Gibbens: Nobody can build any subways in the City of New York without the direction of the Board of Electrical Control; and we have here to-day for the consideration of the Board certain recommendations of the Engineer in regard to building subways, which, I presume, will be acted on by the Board, and any localities mentioned in the communication of the Manhattan Company not covered by these recommendations can be embraced in a further report of the Engineer at the next meeting.

The Board discussed the communication of the Manhattan Company at some length, Commissioner Gibbens offering the following resolution, which was not acted on:

Resolved, That the Secretary be directed to address a letter to the President of the Consolidated Telegraph and Electrical Subway Company, and authorize the work of building the subways in the localities enumerated in the communication of the Manhattan Electric Light Company to be begun and finished immediately.

(Not acted on).

The following report of Engineer Kearny, referred to by Commissioner Gibbens, was then read:

NEW YORK, June 12, 1889.

To the Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN:—I have to recommend that the following subways be constructed:

For the accommodation of telephone and telegraph service:

In 58th street, from Eighth avenue to the west side of Tenth avenue, and from that point northward along Tenth avenue to 59th street.

In Dey street, from Church to Greenwich street.

In Eighth avenue, from 28th to 18th street, and through 18th street, from Eighth avenue to Seventh avenue, to connect with the 18th street conduit now built. The construction of the above described to be iron tubes laid in hydraulic cement concrete.

For electric light and power service:

In 14th street, north side, from Sixth avenue to Union Square.

In 16th street, from Sixth avenue to Union Square.

In 49th street, from the east side of Fourth avenue to the west side of Madison avenue.

In 53d street, north side, from the west side of Sixth avenue to the east side of Fifth avenue.

The above to consist of a special construction, known as the Edison System.

In 42d and 59th streets, from First Avenue to Broadway, iron tubes laid in cement, with distributing box on top, for electric light and power service.

In Broadway, from 14th street to Bowling Green.

In the Bowery and Third avenue, from the Harlem River to Chatham Square.

The construction of the above to consist of iron tubes laid in hydraulic cement concrete, to include a distributing system on the top, consisting of a cast iron box similar to accompanying sketch, to be placed at intervals of about twenty-five (25) feet apart, into which the upper row of ducts will communicate.

The number of ducts for the Broadway and Third avenue conduit to consist approximately of twenty (20).

I have also to recommend that the following crossings of subways be authorized and ordered built, connecting with existing subways:

Broadway, at	36th street, for Electric Light,
" "	37th " " " "
" "	38th " " " "
" "	40th " " " "
" "	44th " " " "
" "	47th " " " "
" "	49th " " " "
" "	50th " " " "
" "	51st " " " "
" "	53d " " " "
" "	55th " " " "
" "	57th " " " "
" "	58th " " " "
" "	Fulton " Telephone and Telegraph.
" "	Reade " " " "
Fifth avenue at	42d street, Electric Light,
" " "	44th " " "
Sixth avenue at	19th " " "
" " "	21st " " "
" " "	23d " " "
" " "	30th " " "
" " "	34th " " "
" " "	40th " " "
" " "	43d " " "
" " "	49th " " "
" " "	52d " " "

Very respectfully,

HENRY S. KEARNY, Engineer of Board.

Commissioner Gilroy (of the Department of Public Works), who was present by invitation of Mayor Grant, questioned by the Mayor, stated that the Report of Engineer

Kearny recommending the building of subways in certain streets mentions only two which are about to be repaved, namely, the Bowery and 49th street, and that it was very necessary that the subways should be built in those streets before repavement.

Mayor Grant: Let Engineer Kearny confer with Commissioner Gilroy and ascertain from him the streets about to be repaved, so that the construction of subways in those streets, if required, may be ordered at once.

Mayor Grant offered the following resolution:

Resolved, That the Report of Engineer Kearny, dated June 12, 1889, read at this meeting, as to the portion thereof recommending the construction of subways and subway crossings as follows:

For the accommodation of telephone and telegraph service:

In 58th street, from Eighth avenue to the west side of Tenth avenue, and from that point northward along Tenth avenue to 59th street;

In Dey street, from Church to Greenwich street;

In Eighth avenue, from 28th to 18th street, and through 18th street, from Eighth avenue to Seventh avenue, to connect with the 18th street conduit now built;

The construction to be iron tubes laid in hydraulic cement concrete;

For electric light and power service:

In 14th street, north side, from Sixth avenue to Union Square;

In 16th street, from Sixth avenue to Union Square;

In 49th street, from the east side of Fourth avenue to the west side of Madison avenue;

In 53d street, north side, from the west side of Sixth avenue to the east side of Fifth avenue;

The above to consist of a special construction, known as the Edison System;

For electric light crossings, as follows:

Broadway at 36th, 37th, 38th, 40th, 44th, 47th, 49th, 50th, 51st, 53d, 55th, 57th, 58th streets;

Fifth avenue at 42d and 44th streets;

Sixth avenue at 19th, 21st, 23d, 30th, 34th, 40th, 43d, 49th, 52d streets;

For telephone and telegraph crossings, as follows:

Broadway at Fulton and Reade streets,

be approved, and that the Consolidated Telegraph and Electrical Subway Company be authorized, directed and ordered to construct these subways and subway crossings;

And that the remainder of said Report, to wit, the portion recommending the construction of subways for electric light and power service,

In 42d and 59th streets, from First avenue to Broadway;
In Broadway, from 14th street to Bowling Green;
In the Bowery and Third avenue, from the Harlem River to Chatham Square;

Construction to consist of iron tubes laid in hydraulic cement concrete, to include a distributing system on the top, consisting of a cast iron box similar to accompanying sketch, to be placed at intervals of about twenty-five feet, into which the upper row of ducts will communicate;

The number of ducts for the Broadway and Third avenue conduits to consist approximately of twenty,

be laid over until the next meeting, when Engineer Kearny is directed to furnish the Board full information in detail in regard to the electric light subways.

Unanimously adopted.

Mayor Grant: The Commissioner of Public Works would like to make a statement about the removal of poles and wires, and if there is no objection I would like to hear it.

Commissioner Gilroy: I would like to state that the condition of the appropriation for the removal of incumbrances is such that the Department of Public Works will not be able to do any more work after this month, certainly not longer than the 14th of July. The amount appropriated originally was \$22,000. Expenditures to the amount of \$17,109.34, including liabilities, have been incurred, leaving a balance of \$4,850.66. The Commissioner further stated as to the amount of the pay roll of the Bureau of Incumbrances, and made an estimate as to the money needed for that branch of the service for the remaining months of the year, showing that the work of removal of incumbrances could not be continued longer than the period stated by him. Concluding, he said: "I think it is proper that the Board should know the exact condition of affairs, so that the responsibility may not fall on the Department of Public Works."

Mayor Grant: We are considering that subject now in the Board of Estimate and Apportionment.

The following communication from Pearce & Jones, Manufacturing Electricians, was read:

JUNE 8TH, 1889.

The Hon. Board of Electrical Control:

GENTLEMEN:—We have received several notices from the Fire Department calling attention to the necessity for the removal of wires from the Department poles, which connect the signal boxes in the various places of amusement, public buildings, etc., with the Fire Department Headquarters, which wires are controlled and maintained by us under authority from the Commissioners of the Fire Department.

Having been granted the privilege by the Commissioners of the Fire Department to place conductors for the purpose along with those of the Fire Department in the same

ducts and in accordance with such notices, we have endeavored to provide underground service in the subways by application to the Subway Company, such conductors to be furnished without expense to the Fire Department, and in their occupancy of the subways to be subject to the approval of your Honorable Board and to the rules of the Subway Co.

We have been unable to secure the facilities, thus far, and the wires are being cut away and destroyed greatly to our damage and also to that of the service.

We therefore kindly ask that the matter receive such immediate consideration as the importance of it requires.

Trusting that you will kindly favor us with an early reply, we remain,

Respectfully,

PEARCE & JONES.

Commissioner Gibbens offered the following resolution:

Resolved, That the opinion of the Corporation Counsel be requested as to the status of the Pearce and Jones Fire Alarm Telegraph Company, which has been operating boxes in connection with the Fire Department, and whether this Company must be treated as an ordinary corporation doing business of an electrical nature or as part of the Fire Department service; and, also, that his opinion be requested, first, as to whether there is any authorized system of Police signaling for the City of New York, and, second, as to whether the wires of said system, necessary to its business, are to be deemed for the purposes regulation Police Department wires or wires of an ordinary telegraph company.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That, upon the application of the Sisters of the Poor of St. Francis, dated June 11, 1889, a permit issue to the Metropolitan Telephone and Telegraph Company to connect St. Joseph's Hospital for Incurable Consumptives with the telephone, and to that end to run a single iron wire from 125th street and Lexington avenue, south-west corner, to 143d street and Brook avenue.

Unanimously adopted.

Mayor Grant offered the following resolutions:

Resolved, That the applications of the United States Illuminating Company to connect with their circuits

600 and 602 Broadway,
1½ Park Place,
310 and 312 Third avenue,
394 Broadway,
383 Broadway,

66 and 68 East 4th street,
116 West street,
47 Barclay street,
395 Eighth avenue,
1484 Third avenue,

518 Grand street,
 9 Battery Place,
 66 Bowery,
 71 Gansevoort street,
 Greenwich and Cortlandt streets,
 1½ Barclay street,
 160 Park Row,
 196 and 198 Park Row,
 Battery Bath at Battery Park,
 49 Broadway,
 314 East Houston street,
 152 Church street,
 35 Walker street,
 259 Broadway,
 12 Park Place,
 310 East Houston street,
 Houston and Allen streets,
 West and Liberty streets,
 174 Fulton street,
 100 West street,
 168 Houston street,
 172 Fulton street, 119 Fulton street,
 307 Broadway,
 349 Broadway,
 277 and 279 Grand street,
 10 and 12 Chambers street,
 263 and 264 Broadway,
 147 Fulton street,

537 Broadway,
 337 Grand street,
 531 Eighth avenue,
 86 Second avenue,
 234 Broadway,
 70 East 4th street,
 84 Broadway,
 25 and 27 South William street,
 199 Fulton street,
 291 Broadway,
 101 West street,
 244 Grand street,
 183 Washington street,
 Corner of Chambers and Washington
 streets,
 191 Third avenue,
 197 Duane street,
 172 Fulton street,
 395 Broadway,
 105 Avenue B,
 458 Eighth avenue,
 203 and 765 Broadway,
 329 Grand street,
 1434 and 1436 Third avenue,
 210 Washington street,
 34 West 30th street,
 7 Barclay street,

being for lamp connections only; and to hang lamps in existing loops at

1008 Third avenue,
 251 West street,
 18 State street,
 238 Fulton street,

196 Duane street,
 93 Park Place,
 145 Fulton street;

to connect with circuits electric motors, at

116 West street and

47 Barclay street,

being merely motor connections, and not involving the stringing of any trunk line wire; he granted.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated May 29, 1889, to temporarily take down the lamp which is now suspended in front of

the premises at No. 278 Grand street, while repairs are being made to the front of the building, and to replace the same when the repairs are completed, it being expected that the repairs will take but two or three days, be granted.

Unanimously adopted.

Commissioner Gibbens stated that he had here a letter from one of the electric light companies to the effect that some of its poles are in a dangerous condition, that it had received from time to time notices from the Board of certain poles as dangerous, but that it was unable to replace them without the Board's permission. The Commissioner offered the following resolution:

Resolved, That whenever, in the City of New York, either the Department of Public Works or the Department of Police or the Board of Electrical Control notifies any Company that a pole is in a dangerous condition, unless the company has been ordered to take that pole down by reason of there being a subway in the street, that it be authorized to replace it.

(Not acted on).

Mayor Grant: While I can appreciate that motion—to prevent a case of accident—I do not think it wise to give the companies a discretion quite as large as that. If you draw a resolution with sufficient safeguards, and offer it at the next meeting, I may vote for it.

The resolution of Commissioner Gibbens was not acted upon.

Application of the United States Illuminating Company to erect new poles and lamp-posts in place of old ones, which have become decayed, cut away or out of plumb, were referred to Engineer Kearny, to be reported on at the next meeting.

Mayor Grant offered the following resolutions:

Resolved, That the applications of the United States Illuminating Company to connect with cables from subway within building to lamps hanging outside of and attached to building, as follows:

Fifth Avenue Theatre, one lamp Broadway,	Sixth avenue and 19th street,
two lamps 28th street,	867 Sixth avenue,
S. E. corner Sixth avenue and 23d street,	No. 12 West 23d street,
110 East 14th street,	No. 8 West 23d street,
1448 Broadway,	362 Sixth avenue,
Sixth avenue and 20th street,	358 and 360 Sixth avenue,

be granted.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company to erect a new support pole in place of an old one, on the south side of 23d street, west of Sixth avenue, to make connection with subway on Sixth avenue, be referred to Engineer Kearny to report on at the next meeting.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated June 6th, 1889, to string two wires on nineteen poles on East 54th street, between Third avenue and Avenue A, also, on twenty-nine poles on Avenue A, between East 54th street and East 69th street, to serve Jones' Woods with electric light during the season, provided permission is obtained from the owners of the poles, be denied.

Unanimously adopted.

Resolved, That the applications of the Brush Electric Illuminating Company to connect electric lamps with its circuits at the following places :

239 Bowery, 231 Eighth avenue, 773 Eighth avenue, 347 Fourth avenue, 169 and 171 Avenue A, 139 8th street, 290 Bowery, 230 Bowery, 253 Sixth avenue, corner of 16th street, 259 Eighth avenue, 100½ Bowery, 202 Broadway, 253 Eighth avenue, 199 Chatham Square, 263 Grand street, 212 Bowery, 308-310 Eighth avenue, 238 Bowery, 93 Bowery, 156 Fourth avenue, 768 Broadway, 30 Bowery, 170 Bowery, 429 Eighth avenue, 512-514 Eighth avenue, 395 Eighth avenue, 417 Eighth avenue, 47 E. 10th street, 309 Grand street, S. W. corner Broadway and Prince street, 141 West 23d street, 120 West 23d street, 237 East 14th street, 51 Spring street, 114 Bowery, 370 Grand street, being for lamp connections only ;

And to make motor connections at the following places :

323 Broadway, 390 Eighth avenue, 93 Bowery, 108 West 23d street and 131 West 23d street ;

And to change the position of lamps at 339 Eighth avenue and to put up two lamps at 180 Bowery ;

be granted.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company to change lamp connections from one circuit to another, on the same street and opposite the same house or store, whenever required in the transaction of its business, be denied.

Unanimously adopted.

Resolved, That the applications of the Harlem Lighting Company to connect existing lines with the following places :

1144, 1327, 1334, 1335, 1428, 1470, 1480, 1550, 1521 and 1522 First avenue, 2340 and

2248 Third avenue, 130th street and East River, 2369 Third avenue, 2330 Third avenue, 2180 Third avenue, 226 West 125th street, being for lamp connections only,

be granted.

Unanimously adopted.

Resolved, That the applications of the East River Electric Light Company to connect electric lamps with circuits at the following places:

340 East 23d street, 203 Bowery, 420 East 5th street, foot of East 55th street, foot of East 65th street, 207 Avenue B, 195 Bowery, 277 Bowery, 19 Third avenue, 269 Bowery, 393 Second avenue, 1114 Third avenue, 57 Second avenue, 429 Eighth avenue, 984 Third avenue, 190 Third avenue, 42 Third avenue, 433 Second avenue, 30 Union Square, 228 Second avenue, 326 Grand street, 448 Grand street, 540 Second avenue, 398 Second avenue, 138 Fourth avenue, 246 Grand street, 260, 484 and 280 Grand street, 202 East 29th street, 122 Second avenue, 274 Grand street, 133 East 13th street, 73 East 4th street, 1251 Third avenue, 123 East 13th street, 3 East 13th street, 126 East Houston street, 187 Bowery, 402 Fourth avenue, 1146 Third avenue, 146 Bowery, 280 Fourth avenue, 423 Fourth avenue, 135 Second avenue, 300 Third avenue, 235 First avenue, 166 Third avenue, 100 Bowery, 15 Avenue A, 63 Fourth avenue, 829 First avenue, 138 Fourth avenue, 130 East 13th street, 125 East 12th street, 170 Third avenue, being for lamp connections only,

And to complete changing of wires from telephone poles on west side of First avenue over to new poles on east side of First avenue,

be granted.

Unanimously adopted.

The following communication from the Western Union Telegraph Company was read:

NEW YORK, June 3, 1889.

Board of Electrical Control, 1266 Broadway, City:

GENTLEMEN:—In accordance with correspondence with Commissioner Gibbens, I beg to submit herewith applications for sixteen overhead connections, from the Ninth Avenue Elevated structure with various offices on the west side of the City.

The granting of those applications will permit this Company to remove poles and wires, as follows:

On Washington St., between Dey and Gansevoort Sts., 2 lines of poles and wires; Thence through Gan't to 8th Ave., 1 line of poles and wires;

And, on the east side of 8th Ave., from Gansevoort to 38th street, 1 line of poles and wires;

And, from 58th St. to 110th St., thence through 110th St. to the Polo Grounds, and in 4th Ave., from 110th St. to 130th St., 1 line of poles and wires.

Also, on Gansevoort St., from Wash'n St. to 13th St., through 13th to 9th Ave. to 125th St., 1 line of poles and wires.

Also, on 10th Ave., from 42d to 51st St., 1 line of poles and wires,

And, on Sixth Ave., from 14th St. to South Fifth Ave., thence to Canal street, 1 line of poles and wires.

Very respectfully,

W. C. HUMSTONE, Superintendent.

Mayor Grant offered the following resolutions:

Resolved, That the applications of the Western Union Telegraph Company

To place four wires on existing poles on West street, from terminal of subway at foot of Chambers street, along and across West street to office on Pier 28, also, to connect the cable at Chambers and Greenwich streets to cable on Ninth Avenue Elevated structure,

To place four wires on existing poles on Franklin street, from Greenwich street to the Mercantile Exchange, located on Hudson street, between Franklin and Harrison streets, as per diagram, also, to connect the same to cable on Ninth Avenue Elevated structure,

To string four wires from terminal of subway at foot of Chambers street to Jay Street Ferry, looping the same into the office at 187 West street, via a line of poles now existing on West street, also, to connect cable at Chambers and Greenwich streets to cable on Ninth Avenue Elevated structure,

To place four wires on poles existing on Canal and West streets, looping said wires into offices at Pier 41, Desbrosses Street Ferry, and Pier 36, as per accompanying diagram, also, to connect the same to cable on Ninth Avenue Elevated structure,

To place a ten (10) conductor cable on poles now existing on Canal and Varick streets, said cable to extend from corner of Canal and Greenwich streets to the office in St. John's Park Depot, corner of Varick and Laight streets, as shown in the diagram, also, to connect the same to cable on Ninth Avenue Elevated structure,

To place four (4) wires on poles now in existence on Morton street and West street, beginning at Morton street, corner of Greenwich street, and ending at office located at the corner of West and Christopher streets, also, to connect the same to cable on Ninth Avenue Elevated structure.

To place a ten (10) conductor cable on poles now existing on Little 12th street, from Ninth avenue to Washington street, across plaza to office in Market opposite, as per accompanying sketch, also, to connect the same to cable on Ninth Avenue Elevated structure,

To place four (4) wires on poles now existing on Gansevoort, 13th street and Eighth avenue, beginning at Greenwich street, and ending at the office, No. 70 Eighth avenue, as per diagram, also, to connect the same to cable on Ninth Avenue Elevated structure,

To place six (6) wires on poles now existing on 21st street, Tenth avenue and 23d street, said wires to extend from Ninth avenue, corner of 21st street, to No. 510 West 23d street, following the route shown by accompanying diagram, also, to connect the same to cable on Ninth Avenue Elevated structure,

To place five (5) wires on the poles now existing on 21st street, Eighth avenue and 23d street, extending from Ninth avenue and 21st street to the office on 23d street, seventy-five (75) feet east of Eighth avenue, following the route designated in accompanying sketch, also, to connect the same to cable on Ninth Avenue Elevated structure,

To string three (3) wires on poles now in existence on the following streets, viz.: 30th street, Tenth avenue, 32d street and Eleventh avenue, said wires to extend from Ninth avenue and 30th street to office at corner of 34th street and Eleventh avenue, and looping in offices at 30th Street Depot and Eleventh avenue, corner of 33d street, as per accompanying diagram, also, to connect the same to cable on Ninth Avenue Elevated structure,

To place four (4) wires on existing poles on 33d street and Eighth avenue, from Ninth avenue to office on 34th street, seventy-five feet east of Eighth avenue, as per route shown in diagram, also, to connect the same to cable on Ninth Avenue Elevated structure,

To place a ten (10) conductor cable on poles now standing in 41st street, said cable to extend from Ninth avenue at 41st street to the Western Union office on Eleventh avenue, nearly opposite 41st street, also, to connect the same to cable on Ninth Avenue Elevated structure,

To place four (4) wires on the existing poles on 57th street, from Ninth avenue to Eighth avenue, connecting Western Union office at No. 895 Eighth avenue, also, to connect the same to cable on Ninth Avenue Elevated structure,

To place a ten (10) conductor cable on the poles now existing on 125th street, between Eighth Avenue and the Western Union office, No. 264 West 125th street, as per diagram, also, to connect the same to cable on Eighth Avenue Elevated structure, and

To place a ten (10) conductor cable on the line of poles now standing on 65th street, west of Ninth avenue, as per accompanying sketch, also, to connect the same to cable on Ninth Avenue Elevated structure,

be granted.

Unanimously adopted.

Resolved, That the applications of the Manhattan Electric Light Company to connect existing lines with

93 Bowery, 114 Bowery, 792, 977, 972, 821 and 803 First avenue, 158 Bowery, 228 Second avenue, 2180 Third avenue, 259 Bowery, 81st street and Avenue B, 767 Broad-

way, 390 Eighth avenue, 277 and 279 Grand street, 744 Broadway, 316 Broadway to 273 Broadway, n. w. cor. Chambers street, Fred Hollender & Co., being for lamp connections only, be granted.

Unanimously adopted.

Commissioner Hess offered the following resolution :

Resolved, That the applications of the Mount Morris Electric Light Company to connect its circuits with electric lamps at the following places :

210 Washington street, on Ninth avenue, Nos. 7 and 68; Sixth avenue, No. 2110, corner Chambers street and Broadway, Staats Zeitung Building, 196 Duane street, 185 Reade street, 188th street and Tenth avenue, 61 Dey street, Vesey Pier, corner Spring and Washington street, 183, 226, 292, 330, 334, 348, 337 and 834 Washington street, 312 Greenwich street, 87 Dey street, 194 Reade street, 93 and 12 Park Place, 7, 11, 19, 23, 43 and 46 Little 12th street, 8 South William street, 514-518 West street, 22 and 24 Warren street, 182, 166, 186, 196 and 198 Reade street, 215 Harrison street, 34 Jay street, 199 Duane street, 71-77 Gansevoort street, 322 Greenwich street, 137 West street, 227 Washington street, 54 and 56 Broad street, 96 Pearl street, 599 Ninth avenue, 781 and 1680 Ninth avenue, 233 Eighth avenue and Eighth avenue, corner 155th street, 2291 Seventh avenue, Tenth avenue and 191st street (three lights), Tenth avenue, corner 175th street, 216 125th street, 155th street, Eighth avenue and St. Nicholas avenue, about five lights,

being for lamp connections only, be granted.

Unanimously adopted.

W. C. Humstone (Superintendent of the Western Union Tel. Co.): I would like to make a verbal application for the restoration of those wires taken down in Tenth avenue by the Department of Public Works. We have been without the use of those wires since the 17th of May. The poles have been "alive" for twenty-five years, not for one minute "dead," day or night.

Commissioner Gibbens stated that the poles were "dead," dangerous, and, as he believed, not necessary to the business of the Company. Mr. Humstone controverted this statement, and

Mayor Grant offered the following resolution :

Resolved, That the application of the Western Union Telegraph Company to replace the wires taken from the Tenth avenue pole line by the Department of Public Works, reported by this Board to that Department as "dead," be referred to Commissioner Gibbens, and that he confer with Superintendent Humstone in regard thereto, and report at the next meeting.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That the application of the Manhattan Electric Light Company, dated June 8th, 1889, to connect C. R. & I. Pacific R'y, 257 Broadway, from 316 Broadway, and other designated parties from points therein specified, be denied.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company for telephone connection—being fifty-three in number—reported by Expert Wheeler as being in districts where there are no subways, be granted.

Unanimously adopted.

An application of the Metropolitan Telephone and Telegraph Company to make connections with new 79th street station was, on motion of Mayor Grant, laid over until the next meeting.

An application of the Metropolitan Telephone and Telegraph Company to run ten wires from 58th street and Eleventh avenue, and so up to Harlem, was, on motion of Mayor Grant, denied.

Mayor Grant offered the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated June 4th, 1889, to run a single wire from 58th street and Eighth avenue, the underground terminal, to 125 West 86th street, be laid over.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated June 12, 1889, to run two wires from 18th street and Fifth avenue (underground terminal), to 110 Fifth avenue, be granted.

Unanimously adopted.

Expert Wheeler reported, approving of the specifications of the Police Department for placing its electrical conductors underground, transmitted by that Department to the Board, and referred to him at a previous meeting; and

Mayor Grant offered the following resolution:

Resolved, That the specifications of the Police Department for the materials, etc., for placing its electrical conductors underground, be approved.

Unanimously adopted.

The following communication from Assistant Secretary Lovecraft was read:

NEW YORK, June 11th, 1889.

To the Board of Electrical Control:

GENTLEMEN:—I beg to offer my resignation as Assistant Secretary of your Board. and at the same time to thank you for the many courtesies I have received.

Very respectfully,

F. A. LOVECRAFT.

Commissioner Gibbens offered the following resolutions:

Resolved, That the resignation of F. A. Lovecraft as Assistant Secretary of the Board of Electrical Control be accepted, to take effect on the appointment of his successor.

Unanimously adopted.

Resolved, That the application of the Metropolitan Telephone and Telegraph Company to run a telephone wire from 132 East 125th street to 326 West 125th street, for Mr. John J. Quigley, be granted.

Unanimously adopted.

Commissioner Gibbens: I have a letter from the Travelers' Exchange, in Union Square, desiring to have a telephone put in there, to be used as a public telephone. I would like the Secretary to be authorized to grant it, provided it is not in a subway district, and does not go over a subway route.

No action was taken upon this request of Commissioner Gibbens.

Commissioner Gibbens had read for the consideration of the Board the following resolution, which he said he would call up at the next meeting:

Resolved, It being necessary to the proper conduct of the business of the Board of Electrical Control and the duties devolved upon it by law, there shall be in the office of the said Board, from and after the first day of July, 1889, a Clerk of Record of Electrical Conductors, whose compensation shall be at the rate of twelve hundred dollars per annum during such time as his services shall be necessary, it shall be the duty of the said Clerk of Record of Electrical Conductors, under the direction of the Secretary of the Board, to keep a book or books, containing a complete record of the reports of the Inspectors of Electrical Conductors of the Board and of all notices sent to companies operating electrical conductors with reference to the condition of the same and of all reports made from whatsoever source of the tests of electrical conductors overhead or in subways, and to furnish, from time to time, such statements as may be required regarding the condition of the electrical conductors, the number of poles and overhead wires removed in accordance with the provisions of law, the location of dangerous poles.

electrical conductors and fixtures and the proceedings taken with reference to the electrical conductors upon the report of every inspection of the same. The Secretary is directed to request the State Civil Service Board to examine such of the Inspectors of the Board of Electrical Control as may appear for promotion to said clerkship.

There shall also be in the office of the Board of Electrical Control a Permit Clerk, who shall receive compensation at the rate of twelve hundred dollars per annum during such time as his services may be required. It shall be the duty of said Permit Clerk, under the direction of the Secretary of the Board, to tabulate and record all applications for permits to place electrical conductors overhead or in the subways, to keep a book containing a copy of every such permit granted by the Board, and to file with the Mayor of the City and with the Police Department a copy of every such permit, and to see to it that every such permit specifies the location of the structures to be erected and to be used for sustaining the electrical conductors, gives the general dimensions thereof, and designates the route and location thereof, and prescribes and regulates the height at which said wires or cables shall be placed, and that such permit is subject to the Rules and Regulations prescribed by the Board and by the local authorities in charge of streets, avenues, highways and public places of the city, and to make such statements, from time to time, as may be required regarding the number of permits applied for, granted, acted upon or revoked. The Secretary is directed to request the State Civil Service Board to examine such of the employees of the Board as may apply for promotion to said clerkship.

The Secretary is further directed to request the State Civil Service Board to examine and report upon the qualifications of such candidate as may apply for appointment to the positions which may become vacant by promotions to the above prescribed clerkships; and, also, to certify to the Board of Electrical Control the names of four competent Inspectors of Subway Construction, whose duty it shall be, under the direction of the Engineer of the Board of Electrical Control, to inspect and pass upon the character of the work done by the Consolidated Telegraph and Electrical Subway Company, and to make reports to the Engineer with reference to said work and with reference to the condition of the subways generally, and particularly as to the presence of illuminating gas, moisture, steam heat or other deleterious influences present therein. And said Inspectors of Subway Construction shall receive a compensation at the rate of four dollars per diem during such time as their services shall be necessary, and while actually engaged under the direction of the Engineer of the Board in the above duties; and the amount of said compensation to which said Inspectors of Subway Construction shall be entitled shall be certified to the Secretary of the Board by the Engineer, and the Secretary shall thereupon require the payment of the same by the Consolidated Telegraph and Electrical Subway Company, in accordance with the contract between the Board of Electrical Control and said Company.

Mayor Grant offered the following resolution:

Resolved, That the application of the North New York Lighting Company, dated

June 13, 1889, to string two wires on Third avenue, 133d to 164th streets, Lincoln avenue, Third avenue to 133d street, 133d street, Third avenue to Alexander avenue, 138th street, Third avenue to Mott avenue, 146th street and Third avenue to 156th street, Rider avenue to 140th street and Third avenue, be denied.

Unanimously adopted.

Mayor Grant: Some time ago I sent to the District Attorney some facts about the United States Illuminating Company, which did not, as I thought, comply with the rules of this Board. The answer of the District Attorney is in this letter; and I offer the following resolution:

Resolved, That the communication of District Attorney Fellows, addressed to Hon. Hugh J. Grant, Mayor of the City of New York, dated June 11th, 1889, in answer to a communication sent to him, and in reference to certain alleged violations of Chapter 716 of the Laws of 1887 by the United States Illuminating Company, be spread in full upon the minutes.

The following is the communication of District Attorney Fellows:

JUNE 11, 1889.

HON. HUGH J. GRANT, Mayor of the City of New York:

SIR:—I have the honor to inform you of the proceedings had in the matter of certain alleged violations of Chapter 716 of the Laws of 1887, which were referred to me, together with a communication from Schuyler S. Wheeler, Electrical Expert of the Board of Electrical Control of this city, upon the subject, in your letter of the 27th ultimo.

After a consideration of Mr. Wheeler's communication and an examination of the witnesses having knowledge of the alleged violations, it was decided that an indictment could be properly found against Albert E. Scoullar, the Superintendent of the United States Illuminating Company of this city, for having unlawfully erected and maintained and caused and procured to be constructed and maintained above ground at two different places in this city, on or about the sixteenth day of May, 1889, certain electrical conductors and figures and devices therefor and certain wires, to wit, certain electrical lamps commonly called electric light lamps, for the erection and maintenance of which no permit in writing had been first obtained from the Board of Electrical Control or its predecessor, in violation of the above law.

On the seventh day of June this charge against Scoullar was placed before the Grand Jury, and Daniel L. Gibbens, one of the Commissioners of the said Board of Electrical Control, and Malcolm S. Keyes, an inspector employed by the said Board, duly attended before the Grand Jury and gave their testimony touching such alleged violations.

Inasmuch as the charge was dismissed and an application thereafter made by me to the Court for an order directing its resubmission to the Grand Jury upon an affidavit setting forth what testimony was adduced in support thereof, I deem it proper that I should inform you of the matters put in evidence before the Grand Jury. The following facts were brought out by the testimony of the said witnesses wholly uncontradicted by any evidence whatever, to wit, that the defendant, Albert E. Scoullar, was at the

time charged and yet was the superintendent of the United States Illuminating Company, having the general charge and management of their wires and lamps, and by his direction and authority wires and lamps were put up and maintained; that on the said 16th day of May, 1889, an electric light lamp was attached to a wire loop already erected in front of the premises, 206 Duane street, in this city, and on the same day another electric light lamp was, in like manner, attached to a wire loop already erected in front of the premises, 154 West street; that both of these lamps were of the kind and character used exclusively by the said United States Illuminating Company; that no permit in writing for the erection of the said lamps had been first obtained from the said Board of Electrical Control; that the defendant had thereafter admitted to Commissioner Gibbens that he had directed the erection of the said lamps and that the same were erected by his direction and authority, but that the same had been erected under a misapprehension and no intention existed to violate the law, and, further, that the lamps had been taken down after complaint was made.

Being convinced that upon this evidence the charge had been dismissed by reason of a misapprehension on the part of the Grand Jury of the law relating to the case, I thereafter, and on the tenth day of June instant, moved before Mr. Justice Cowing, presiding in Part One of the Court of General Sessions, for an order directing a resubmission of the charge, as above stated, upon the affidavit of Deputy Assistant District Attorney Lindsay, who had charge of the case before the Grand Jury, which affidavit set forth the facts herein stated, and further alleged that the charge against the defendant was well founded, both in law and on the evidence, that justice required that an indictment be found, and that there was reason to believe that if the said charge was again submitted to the Grand Jury evidence could and would be adduced sufficient to warrant the finding of an indictment, and upon a correct understanding of the law by the Grand Jury an indictment would be found.

The order was granted by Mr. Justice Cowing, and, upon my application, he charged the Grand Jury directly in reference to these cases, stating, amongst other things, that ignorance of, or a lack of, intent to violate the law was no defence, and that if it appeared before the Grand Jury that the law had been violated, whether from ignorance, misapprehension or otherwise, it was their duty to find an indictment.

On the same day I again placed the case before the Grand Jury, and, after a reconsideration thereof, it was again dismissed.

I am, very respectfully yours,

JOHN R. FELLOWS, District Attorney.

The following communication from the Consolidated Telegraph and Electrical Subway Company was read:

NEW YORK, June 8, 1889.

THEODORE MOSS, ESQ., Secretary Board of Electrical Control, 1266 Broadway, City:

DEAR SIR:—In answer to your favor of the 1st inst., we annex hereto a scale of rentals, showing the rates of charge for the use of the subways constructed by this company in the City of New York.

If any explanation or facts are desired by your Honorable Board, we shall be ready to furnish them.

Very respectfully yours,

EDWARD LAUTERBACH, President.

NEW YORK, June 8th, 1889.

SCALE OF RENTALS.

1	inch ducts	\$450	per mile per annum			
1¼	" "	500	"	"	"	"
1½	" "	550	"	"	"	"
2	" "	700	"	"	"	"
2½	" "	850	"	"	"	"
3	" "	1,000	"	"	"	"
4	" "	1,250	"	"	"	"

Distributing ducts, any size
up to 4 inches diameter, \$1,000 per mile per annum.

Mayor Grant: I request the Secretary to send me a copy of the scale of rentals.

Commissioner Gibbens offered the following resolution:

Resolved, That the Board adjourn to Monday, June 17th, 1889, at 12 o'clock M.

Unanimously adopted.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, June 26th, 1889, at 2 o'clock P. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

On motion of Commissioner Gibbens, the reading of the minutes of the last meeting was dispensed with.

The following communication from Mr. William Maver, Jr., was, on motion of Commissioner Gibbens, ordered to be spread on the minutes:

DANIEL L. GIBBENS, Esq., Commissioner, Board of Electrical Control, Broadway and 30th St., New York:

DEAR SIR:—I have your favor of the 1st inst. in which you ask me to place at your disposition a paper which you have been informed I had prepared, relating to electric light insulation and underground wires. In reply I would say that, knowing of the facilities at your command for obtaining information on these subjects, it would scarcely have occurred to me that the said paper contained anything particularly worthy of the consideration of the Board of Electrical Control. But since it appears that others have thought differently, I take pleasure in submitting, in the following pages, in compliance with your request, the subject matter of that paper, to be disposed of as you may please.

In explanation of the elementary style of at least a part of the paper, it should, perhaps, be stated that it was originally written to explain, in a non-technical manner, the cause of the frequent accidents that have occurred from the use of non-insulating ma-

terial as a covering for electric light wires, especially overhead wires, and reasons why the discontinuance of the use of such material should be hastened. In the same paper are included incidentally the results of a number of electrical tests made by the writer, of various kinds of insulating material; some comments concerning the conditions that must be met and withstood by insulating material for underground wires and a few remarks suggested by the results of practical observations in connection with the construction of underground electric light circuits.

Before proceeding to discuss the main subjects, I shall, briefly as may be, first define more clearly the meaning of the term "non-insulating material," and shall, at the same time, indicate in advance some of the electrical laws or actions, and terms, to which I shall have occasion to allude in the course of my remarks.

The passage of electricity through a conductor may be likened to the flow of water through a pipe. The pressure of water in the pipe will depend primarily upon the height of the source of supply, if a reservoir be the source, or upon the pumping pressure, if a pump be employed. The strain upon the sides of the pipe conveying the water will increase or decrease with variations in the height of the reservoir, or, in other words, with the initial pressure. If the pressure of the water on the sides of the pipe exceeds its strain-bearing qualities, it will yield, the water will flow out at the break, and, if danger to surrounding property does not ensue, the water, at least, will be wasted. But if the pipe withstands the pressure, the water may be conveyed miles from its source and be utilized, at the most remote point, to advantage. In choosing a conduit for such a purpose, therefore, it would be manifestly unwise to adopt a pipe composed of ordinary card board, or equally weak material, since a pipe composed of such materials would not retain the water long within bounds.

Analogously, electricity is raised to a certain height by a battery, or is pumped, so to speak, into a conducting wire at a certain pressure by dynamo electric machines. It may be assumed for the present purpose that this pressure raises the electricity from zero to a certain height above zero, zero being the earth; and it may also be assumed that the electricity will seek the nearest outlet back to its zero, the earth. The electricity being thus raised to a pre-determined height or pressure, if a good conductor of electricity, such as a copper or iron wire, be employed, the electricity may be conveyed miles from its source and there utilized to advantage. This is assuming that the conductor, if it be a bare wire, does not come into contact, at any intermediate point along its course, with the earth, for, in that case, the electricity would escape at that point, and, if no damage to adjoining life or property ensued, the electricity would, at least, be wasted. The electricity does not escape from the bare wire to the earth while suspended in the air, because the air surrounding the wire is a non-conductor of electricity. There is this difference between the results following the break in a water pipe or conduit and the escape of electricity from a wire. In the former case, the danger to life and property will depend upon the volume and pressure of water issuing from the fissure and the physical formation of the ground in the region of the break. In the case of the escape of electricity to the earth, if the current be intercepted by any creature having life, the injury received will depend upon the pressure and volume of the current and its physiological effect upon the particular person or animal intercepting it, or, if the wire should fall on a conductor of moderate electrical resistance leading to the earth, as, for example, a roof, awning, etc., any injury ensuing will be due to the heat generated by the current in overcoming that resistance, and if the substance should be of an inflammable nature and the electric current of sufficient pressure and volume, fire will result.

There are many other substances besides air which are non-conductors of electricity, for example, glass, dry wood, dry cloth, mica, india rubber, gutta percha, etc., and if a conductor of electricity be covered with such non-conducting materials, it may be laid on the ground or underground or under water, without danger of the current escaping from the wire; this is assuming that the wood or cloth shall be kept dry. When a wire is thus covered it is said to be insulated.

Ordinary moisture is a fair conductor of electricity. Thus wet cloth and paper when water-soaked become fairly good conductors of electricity. It would, therefore, be as manifestly unwise to choose as a covering for an electric light conductor an unprotected moisture-absorbing material or any other non-insulating material with any hope of preventing the escape of the current from the conducting wire to the earth, should it, by any accident, come into contact therewith, as would be the employment of water pipes made of ordinary card board, and expect such pipes to convey water, under a high pressure, in safety.

It is to electric light conductors covered with material of this nature, and which is generally known as "underwriters' wire," "weather-proof wire," etc., (which, in the one case, is a fair absorbent of moisture, and, in the other, a fair conductor of electricity), that I have hitherto referred.

While I have said that some substances are conductors and that others are non-conductors of electricity, this is only to be considered as relatively true, for it is known that all substances are conductors of electricity; but some conduct it so very poorly that, by comparison with those which are good conductors, they are termed "non-conductors." Good conductors are, therefore, said to offer but slight resistance to the passage of electricity through them, while the non-conductors, such as gutta percha, india rubber, mica, etc., offer a very high resistance. Electrical resistance is capable of definite measurement, and the unit of resistance is technically termed the "ohm." One ohm, roughly speaking, may be said to be equal to the resistance which a copper wire, one mile long and a little less than a quarter of an inch in diameter, would offer to the electric current.

Electrical pressure is also measureable and the unit of pressure is technically termed the "volt." This electrical pressure is at its height at the source of the electro-motive force and the pressure falls directly as it overcomes electrical resistance. For example, assuming an electrical pressure of 100 volts at the source of electro-motive force, and a circuit having an electrical resistance of 100 ohms the pressure at a point removed a distance of 50 ohms along the circuit would be 50 volts. In ordinary Morse telegraphy the average electrical pressure at the source of the electric current does not much exceed 100 volts, although in special cases a pressure of 300 and 350 volts is employed. This latter pressure, however, having exhausted some of its energy by being caused to pass through a stated electrical resistance before reaching the outside public, has never been known to exert fatal injury to human life, although in some cases it has been known to originate fires, when improperly insulated wire has been used. Shocks, however, from a current of even that pressure are not by any means agreeable, and in a number of cases the operatives in charge of telegraph offices have received severe burns on the hands from accidental contact with the bare wires conveying currents of that pressure.

In electric lighting the pressure ranges from 200 to 2,000 volts, and, in many instances, the current is delivered at the lamps at almost the same pressure at which it leaves the dynamo machine.

With regard to the effect of receiving a shock from a current of 2,000 volts pressure, while some claim to have withstood it, that or even a much lower pressure may be considered as very dangerous to life if the bare or improperly insulated conductor should be touched by a person standing on the ground, thereby diverting the current through his own body to the earth.

The electrical resistance of the insulating material of one mile of wire covered with a good quality of insulation would be equal to a copper wire of the size just given, which would reach from the earth to the sun, back and forth, over fifteen times. In other words, if the electricity depended on escaping from the conductor to zero (or earth), through such insulation, it would have to overcome a resistance of over 1,500,000,000 ohms. Now, this resistance of 1,500,000,000 ohms represents the total resistance of the insulation of a wire one mile in length, of which every portion of the insulation is assumed to be lying in direct contact with the earth. If, on the other hand, we imagine that but six inches of the insulation is thus in contact with the earth as when it might be resting on a roof, the electrical resistance offered to the current would be at that point 15,840,000,000,000 ohms, and, since electrical pressure decreases in proportion as it overcomes resistance, it is evident that a conductor conveying currents of the highest pressure used in electric lighting, if covered with insulation of such high resistance, might be handled with impunity. Considering certain grades of underwriters' material in the same way, and placing the resistance of the same at 1 ohm per mile, which I believe to be high, we would have a resistance of 10,560 ohms for any six inches of its length, a resistance which would be no barrier to the escape in large and increasing quantities of the current from electric light wires.

Proceeding now to my reasons for thinking that the employment of non-insulating material as a covering for the conductors used in electric lighting is in a fair way to be discontinued, and why I think its discontinuance should be hastened, I would state, in the first place, that there is not much doubt that the examples of Chicago, Philadelphia and New York, in ordering all electric wires to be placed underground, will be ultimately followed by other cities, and, this being the case, the owners of subways, in order to protect their own property and the property of the users of the subway, will not permit the employment in their conduits of any but a high grade of insulated wire. Already the rules and regulations touching this point which have been approved by the Board of Electrical Control, New York, are such that a material of high electrical insulation must be employed. For instance, these rules require a resistance of the insulating material covering the conductors carrying electric light currents, of at least 15,000,000 ohms or units of electrical resistance, per mile, for every 100 units of electrical pressure. For a current of 2,000 units of electrical pressure this requires a resistance on the part of the insulation of the underground conductor of 300,000,000 ohms per mile. There is not the slightest difficulty in securing an insulating material to meet these requirements, but underwriters' wire and wire of lower grade of insulation which have been so extensively used in the past for overhead electric light conductors would be, for underground purposes, quite useless.

The first report of the Board of Electrical Control to the Legislature at Albany states concerning underwriters' wire: "Underwriters' wire is a wire covered with tape saturated with white lead, and a certain amount of usage renders it susceptible to moisture. After being in use still longer the tape rots away and leaves the naked wire exposed."

If underwriters' wire and certain other covered wire used in electric lighting were no worse than this, it would surely be bad enough, but, as a matter of fact, there exist

to-day miles of electric light wire of such inferior insulation that during the first and every subsequent rain storm encountered the wire is uninsulated except by the surrounding air. Indeed, the material composing much of this so-called insulation is in reality a fairly good electrical conductor, when moist, the term "insulator," as applied to it, especially at such times, being a misnomer, and the use of such inferior insulating material, in view of the admitted fact that electric light conductors, especially aerial conductors, whenever improperly insulated, are very dangerous, both to life and property, must, at least, be considered reprehensible. The employment of such wire, looked at from the point of view of danger to life and property, is, indeed, much more dangerous than would be the employment of bare wire, because the former assumes to secure to the public an immunity from the electric current (which in reality it does not), and, therefore, it is permitted to be placed in positions where bare wire would not be tolerated, its dangers being apparent. In connection with this latter statement it may be mentioned that a certain electrical engineer of this city, in commenting on the injury sustained by a man who had happened to lean on a guy wire which was in communication with an electric light conductor carrying high pressure alternating currents, and, the said engineer, desiring to emphasize his argument as to the danger of employing such currents, added: "In this case the insulation of the alternating current wire was apparently perfect. It is not an uncommon thing for telephone and District telegraph apparatus to be burned by their wires coming in contact with the alternating current conductors; any person who then touches a telephone or call-box runs a terrible risk. This brings the danger home to nearly all of us."

Had it suited the purpose of this engineer to inquire carefully into this matter, he would most probably have discovered that the electric light wire was simply covered, not insulated, with "underwriters'" or a similar non-insulating material, and it would not, perhaps, be difficult for the users of the alternating current to make this clear in this and similar cases, but that such evidence might show the necessity for a thoroughly insulated and consequently more expensive wire. As well, however, might railroad bridges be supported on pipe stems or steam boilers be made of tin, and then attribute the inevitable accident to a too heavily loaded train, and the resulting explosion to an excess of steam pressure. True, accidents and explosions do occur even when the best material obtainable has been employed in the construction of railroad bridges, and where the strongest material procurable has been used in the construction of boilers. But no one questions that the number of accidents and explosions are greatly lessened by the employment of proper materials.

In many instances the material used in the covering of underwriters' wire is non-inflammable—that is, the covering itself will not ignite should the wire accidentally fall on a roof and originate fire, and this appears to have been considered the desideratum by the underwriters, apparently overlooking the very important fact that fire is, under such conditions, much more likely to be originated by the electric current when the conductor is covered with a non-inflammable material which is a fairly good conductor than when covered with an inflammable material which is a non-conductor, for the simple reason that, so long as the current is unable to pass from the conductor to the earth, there will be no undue tendency to the production of heat. If, however, there be any virtue in the use of a non-inflammable covering, such a covering could easily, and at but little additional expense, be placed over a properly insulating material.

In the matter of the use of non-insulated electric light wire, the authorities of New York City have, in the past, been even more lax than those of some other cities. For instance, it is known that covered wire of a certain quality, somewhat extensively used in New York City, has been rejected as unfit by the underwriters of an adjoining city,

Aside from the increased liability of accident to life and damage to property arising from the employment of poorly insulated electric light conductors, there is another feature of the case which should, and doubtless will, tend to hasten the disuse of such wire—namely, this, that in electric lighting every unit of electricity generated by the dynamo machines means the consumption of a certain amount of coal. To keep the lamps up to a standard candle power a certain electrical pressure is required, and, consequently, every unit of electricity escaping to the earth, owing to inferior insulation of the wires or otherwise, is equal to so much waste of coal. Recognizing this fact, and being painfully reminded of it, especially at every recurrence of wet weather, certain wise managers of electric lighting plants are already voluntarily replacing “underwriters’” and weather-proof wire by insulated wire of a much higher grade.

The foregoing remarks have referred almost exclusively to the insulation of electric light conductors for the reason that the principal telegraph companies have for many years past appreciated the value of a good insulation for their conductors and as a rule, used no other. And it may be cited as showing that durable and reliable insulating material is obtainable, that aerial cables, freely exposed to the elements, in the vicinity of New York, as well as elsewhere, have been in operation for years, and are to-day giving unimpaired service.

In my allusions to underwriters’ wire, I desire to include all wire of an inferior grade of insulation.

As a possible matter of interest I may say that I have made at different times during the past four or five years comparative tests of covered wires, and I have found the variation in resistance of the material employed to range from less than one ohm and 600 ohms per mile in the case of underwriters’ and certain weather-proof wire to 600,000,000 and 1,500,000,000 ohms per mile in the case of high grade insulation, such as the Okonite, the Kerite, the Safety Insulated, Bishop Rubber Compound, etc., all the samples having been tested after immersion in water for several days. It is well known also that several lead covered insulated wires such as The Cobb Vulcanite, The Standard Underground, as well as The Okonite, The Safety Insulated, and Bishop Rubber when lead encased, in some instances, show even a higher insulation resistance than the highest just given.

The following are specific results of recent tests of certain insulating materials, which I shall here classify by letters:

Insulation Resistance per mile, ohms.	
A	2,000,000,000
B	1,500,000,000
C	1,500,000,000
D	500,000,000
E	3,000,000
F	30,000
O	20,000
H. I. J.	1.2

These tests were also made after the unprotected insulation had been immersed in water 48 hours, and the results clearly show, as already intimated, that the low grade covering does not deserve the name of insulator. In fact, it may be noted that very few of the manufacturers of low grade covering make any claim for insulation, simply asserting that it is either fire-proof or weather-proof, or both. If, however

by "fire-proof" the meaning intended to be conveyed is that fire will not be originated by the electric current when the conductors are so covered, and by "weather-proof" that the covering will not absorb moisture, the statement may be freely made that, in many instances, such covering is neither fire-proof nor weather-proof.

The insulation resistance of any of the high grade insulating materials just mentioned, or any equally good insulating material, would far exceed the present requirements of the New York Board of Electrical Control, and the use of such "insulation" as a covering for the aerial electric light conductors in place of the, electrically considered, practically bare conductors so extensively employed at present, would not only permit the handling of the conductors with comparative safety, in case of necessity, as, for instance, during fires, but would also entirely prevent any escape of the current from the wire to the earth, should the conductor fall on roofs, awnings, etc., until removed therefrom by the repairmen, and thus would undoubtedly largely diminish the record of injury to life and property which has been, heretofore, so marked a feature of the prostration of electric light wires, especially at the recurrence of every severe storm, and which, it is safe to say, in ninety-nine cases out of one hundred, would not occur were the said wires properly insulated.

The inferior class of wire herein referred to is manufactured because there is or has been a demand for it, and it has been bought because it complied with the underwriters' requirements, where such exist, and especially because it is, at first cost, cheap. When it is fully realized by the public that its continued use for electric lighting purposes is, as it has been in the past, inimical to the public safety; by the underwriters that it is not a protection against fire, a knowledge of which facts is fast developing, then, there is no reason to doubt, that it will be entirely superseded by a wire insulated to a point of safety to all concerned.

I would say that I do not by any means claim to hold a monopoly of the views expressed herein as to the dangers accompanying the use of improperly insulated aerial electric light conductors, views which are entertained by probably every electrical engineer in the country, and which have found apt expression in the application of the term "undertakers' wire" to what I have hitherto termed "underwriters' wire."

What I have said heretofore in this letter refers almost exclusively to the dangers arising from and the expense incurred by the use of inferior insulating material as a covering for electric light wires, and I have incidentally pointed out that there need be no particular difficulty in securing a proper insulating material.

My remarks on this subject have referred almost entirely to overhead conductors, in which capacity, apart from durability, the main essentials of an insulating covering are high electrical resistance and impermeability to moisture, and I have attempted to show that the former cannot be secured without the latter.

For underground purposes, however, and especially in large cities, the conditions are materially changed, and besides protection from mechanical injury some additional requirements are set up.

Firstly.—There must be guarded against the presence of gases, acids, etc., in underground conduits, due to leakage from gas mains, decompositions in the soils, etc.

Secondly.—The high temperature due to the proximity of steam boilers in vaults, the presence of steam pipes in the streets, etc.

As regards the action of gases, it is generally admitted that it would speedily de-

stroy any of the known materials or compounds possessing high electrical resistance, if such materials should be placed, unprotected, underground.

There are several compounds which, it is asserted, if placed around the insulating material covering the conductors, would render the insulation gas proof, but as yet this assertion has not been proven by actual practical tests.

The knowledge of this injurious action of gases, etc., upon the insulation of underground wires has, as is well known, conduced to the almost universal employment of lead as an outside covering or protection for the insulating material of such wires. Lead, for this purpose, possesses many advantages peculiar to itself. It is capable of being placed, when cold, over the insulating material in continuous lengths; it is easily cut for jointing and as easily renewed after jointing; the insulated conductor covered with this metal is flexible, and so long as the lead itself is uninjured it entirely prevents the passage of moisture or water to the enclosed insulating material.

It should be observed that failures of the first lead covered cables were caused by the action of gases or acids upon the lead—at least this was the supposition. This led to the trial of an alloy of lead and tin, which so far as I am able to learn, appears to resist the gases encountered in the underground conduits, and, consequently, lead with an alloy of about 5 per cent. of tin is now very extensively used. This alloy is a somewhat harder substance than the unalloyed lead, but it still remains sufficiently pliable for practical purposes. Some manufacturers, however, retain the pure leaden envelope and cover it with a braid which it is claimed is gas proof.

Having secured, in this metal, an envelope for the insulating covering of the conductor which is earth proof, water proof, presumably gas and acid proof, and to a certain extent a protection against mechanical injury to the insulation, it may be thought that any material which possesses high electrical resistance can be used for underground purposes. This, however, is not altogether the case, for in addition to the possibility of an abrasion to the lead envelope which might admit gas and moisture, there remains to be guarded against, as already stated, the high temperature frequently found in the vicinity of the conduits. Otherwise the choice might lie between gutta percha, India rubber, India rubber and gutta percha compounds and other equally good insulating materials and compounds. But since the temperature of the conduits may be expected to rise much higher than the melting point of gutta percha, which is about 102° F., the use of that or similar material is virtually out of the question for underground purposes in cities, inasmuch as by such softening the metal conductors, especially the heavy conductors used in electric lighting, would sink to the lead covering, thereby "grounding" the circuits.

In addition to the foregoing mentioned requisites of underground cables, there are others which may ultimately be found to require consideration, but to only one of which I can at present allude, namely, the strain bearing quality of the insulation under very high electrical pressure, for it has been observed in practice that the latter quality does not depend always upon the specific resistance of the insulating material.

In conclusion it may be said, however, that it will matter but little what may be the excellence of the insulating material if great care is not exercised, in the process of drawing the cable into the conduits, to preserve the lead covering and the insulating material intact, and this care will have been wasted if in addition thereto proper caution is not observed in the making of joints at the manholes and elsewhere.

It was recognized 25 to 30 years ago in submarine cable laying that the weak point of cables were the joints, and only the most expert workmen were permitted to make them. Furthermore, it was demonstrated that some men are physically incompetent to make joints owing to greasy exudations from their pores, etc. It may be that the same expertness is not required in making joints for underground wires or at the junction of the overhead with the underground systems, as in the case of submarine cables, but the necessity for expert workmanship in this respect is made manifest when it is stated that in more than one instance the work of several supposed skillful jointers has had to be entirely undone and then done over by expert jointers, in order to bring certain cables up to a required state of insulation. And the further need of expert and moderately intelligent workmen in joint making, especially, indeed, in the case of lead covered cables, will be apparent when the fact is announced that more than one workman has, in making joints in such cables, permitted the conductor to come into contact with the lead covering, thereby grounding the circuit, the excuse in each case being ignorance of the fact that the lead went to "ground."

Yours respectfully,

WM. MAVER, Jr.,

Member American Institute Electrical Engineers, Ex-Electrician
Baltimore and Ohio Telegraph Co., &c.

The following report of Electrical Expert Wheeler was read and, on motion of Commissioner Gibbens, ordered to be spread on the minutes:

Report of Electrical Expert of Poles and Wires removed for one year ending June 15th, 1889.

By Companies.	Miles of Wire.	No. of Poles.
Met. Tel. & Tel. Co.....	100	82
Western Union Tel. Co.....	502	372
Fire Department	40	170
Harlem E. L. Co.....		134
United S. Ill. Co.....	23	115
Brush Ill. Co.....	54	56
Total	719	929
By Bureau of Incumbrances.....	775	1,448
Grand Total.....	1,495	2,417

Commissioner Gibbens offered the following resolution, which was discussed at some length, but not pressed to a vote by the Commissioner, upon the suggestion by Mayor Grant that it would be unwise to adopt it:

Resolved, That whenever it appears from the report of the Inspectors of the Board of Electrical Control that any wires or fixtures erected in any street or avenue in the city of New York, except the streets and avenues where subways have been provided, are in a dangerous condition, owing to changes in buildings in the locality, or for any other reason, the Secretary of the Board shall issue a permit and order the companies maintaining such dangerous wires or fixtures to replace them with proper

wires and fixtures or change the position and location of the wires and fixtures so as to avoid dangerous proximity to objects in the streets and avenues; but such permit and order shall not give said companies any further rights or any new or increased facilities.

(Not acted on.)

Pending the consideration of the resolution offered by Commissioner Gibbens, Mayor Grant called upon Engineer Kearny to make a report in the matter of the applications of the United States Illuminating Company to replace rotten and dangerous poles and lamp-posts referred to him at the last meeting.

Engineer Kearny, reporting on the applications of the United States Illuminating Company referred to him at the last meeting, stated: "Among all the cases of alleged rotten and dangerous lamp-posts and poles specified in the applications of the United States Illuminating Company, I have seen no case in which there is a present necessity of replacement. There are some poles that have been cut around with wire, but they still have strength sufficient to hold them up for two years to come."

Mayor Grant: Here are a number of applications by the United States Illuminating Company for the replacing of poles, all of which Engineer Kearny says is unnecessary. I believe this is a good illustration of their requests, and I am of the opinion that this power which the Board has ought not to be delegated.

Commissioner Gibbens: This resolution is intended to cover not only the applications from companies, but also the cases in which we receive notices—as we do very often—from the Department of Public Works and from the Department of Police to the effect that poles are in a dangerous condition. The Inspectors of the Board of Electrical Control are competent to report as to whether a pole is in a dangerous condition or not, and the resolution only allows the company to replace the pole with a pole of the same size and remove at the same time the pole which is dangerous. There can be no advantage to the company in that. It is in the interest of the public safety.

Mayor Grant offered the following resolution:

Resolved, That the report of Engineer Kearny upon the applications of the United States Illuminating Company to replace rotten and dangerous poles be accepted and adopted, and that it be spread upon the minutes.

Unanimously adopted.

Commissioner Gibbens, as a committee, submitted the following report:

NEW YORK, June 14th, 1889.

To the Board of Electrical Control:

GENTLEMEN:—Your committee to whom was referred the matter of the Western Union line in Tenth avenue and West street respectfully reports, as follows:

The question as to the cutting of these wires is reserved, and has not been thoroughly investigated by your committee.

Inasmuch as the Superintendent of the Western Union Telegraph Company has been able to show to your committee conclusively that the taking down of the pole lines in Washington street and elsewhere—agreed to at the last meeting of the Board of Electrical Control—renders it absolutely necessary to the business of the Western Union Company that it should maintain five circuits upon the line in West street and Tenth avenue, your committee therefore recommends that a permit be granted to the Western Union Telegraph Company to replace five wires upon the poles on West street and Tenth avenue, between Gansevoort and 17th streets, and connect the same over existing lines.

Very respectfully,

DANIEL L. GIBBENS, Committee.

Mayor Grant: Mr. Humstone, do you claim any liability from us in respect to the cutting of these wires?

Mr. Humstone (Superintendent of the Western Union Telegraph Company): Not as far as I know. My anxiety now is to restore those circuits.

Mayor Grant: Does this call the dispute off?

Mr. Humstone: So far as I know, it does. I have no authority, but I presume it does.

Commissioner Gibbens: There is nothing in the report which would prejudice any dispute.

Mayor Grant: I understand that; but the Company being granted a permit, it should waive any claim of liability.

Commissioner Hess: I move the following resolution:

Resolved, That a permit issue to the Western Union Telegraph Company to replace five wires upon the poles on West street and Tenth avenue, between Gansevoort and 17th streets, and connect the same over existing lines; provided and upon this condition, however, that said Company waive any and all claims for damages, by reason of the cutting and removing of any wires from those poles, against the city, the Board of Electrical Control, or their or either of their agents or servants.

Unanimously adopted.

On motion of Commissioner Gibbens, the following communication of the Com-

missioner of Public Works relative to the removal of poles and wires was ordered to be spread on the minutes:

NEW YORK, June 7, 1889.

HON. HUGH J. GRANT, Mayor and President of the Board of Electrical Control:

SIR:—I have the honor to inform you that I am now in receipt of report from the Superintendent of Incumbrances that he has completed the removal of electric light poles and wires and telegraph and telephone poles and wires, as ordered in your letter of April 25th ultimo, viz.:

- On 6th avenue, from 23rd to 19th street,
- On 24th street, from Broadway to 6th avenue,
- On 26th street, from Broadway to 6th avenue,
- On 8th avenue, from 42d to 58th street,
- On 58th street, from Broadway to 6th avenue.

He also reports upon a letter of 30th ultimo, from Mr. Wheeler, the Electrical Expert to your Board, that he has completed the removal of poles and wires of the Western Union Telegraph Company, beginning at the corner of Broad and Water streets, through Broad street to Exchange place, and through Exchange place to New Church street.

As to the removal of "all dead poles and wires," as required by your order of April 25th, he states that he is awaiting instructions from the Board of Electrical Control, giving the specific locations, etc.

Very respectfully,

THOS. F. GILROY, Commissioner of Public Works.

Commissioner Gibbens called the attention of the Board to a communication before it from the New York Steam Heating Company, urging the Board's consideration of an application on its behalf from the United States Illuminating Company to erect two support poles on Pier 23, North River, foot of Vesey street, and to run two wires thereon, also to a communication from the last named Company in support of its application; and

Mayor Grant offered the following resolution:

Resolved, That the application of the United States Illuminating Company to erect two support poles on Pier 23, North River, foot of Vesey street, and to run two wires thereon, for the purpose of serving the New York Steam Heating Company with electric lamps at its coal docks, be denied.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That the application of the Electric Power Company, dated June 25th, 1889, to string wires over certain streets therein designated, from proper housetop fixtures, in place of wires now attached to poles in such streets not now provided with

underground accommodations for such wires, it being understood that the said Company will remove the said wires under the conditions and in conformity with Rule XXXII, be laid over.

Unanimously adopted.

The following opinion of the Counsel to the Corporation was, on motion of Commissioner Gibbens, ordered to be spread on the minutes:

NEW YORK, June 17th, 1889.

HON. THEODORE MOSS, Commissioner and Secretary of the Board of Electrical Control:

SIR:—I have received your letter of the 29th ult., in relation to poles used for supporting the wires of electric lighting companies.

Your letter recites the following facts:

1. That in many instances telegraph and telephone companies have allowed their poles to be used to carry the wires of electric lighting companies.
2. That in some cases said poles are no longer required for the business of the telephone and telegraph companies by which they were erected.
3. That such poles are now used only by an electric lighting company under an agreement made with the telephone or telegraph companies prior to the time when such company ceased to use the same.

Your letter then asks:

1. "Is it within the power of a telephone or telegraph company to make an agreement with an electric light company which shall be binding upon the city as to the use of its poles, after the telephone or telegraph company has ceased to have the right to maintain said poles, by reason of their not being necessary to its business?"
2. "What degree or kind of contract must the electric light company make with the telephone or telegraph company to protect it in the use of such poles after they have ceased to be necessary for the business of the company which originally erected them?"

In answering these inquiries I shall assume that the telephone and telegraph companies and the electric lighting companies have each, respectively, acquired a legal right to exercise their respective franchises in the public streets; upon this assumption the poles in question were lawfully placed in the streets and cannot be deemed to be nuisances unless, as matter of fact, they are so constructed as to inconvenience the public use of the street unnecessarily, or have become unnecessary for the transaction of the Company's business.

Peo. vs. Met. Telephone Co., 11 Abbott, N. S. 304.

The first question involves, in the first instance, an inquiry with the right of a telegraph or telephone Co. to lease to an electric lighting company the use of its poles for lighting purposes.

The franchise of a telegraph or telephone company is, without doubt, confined to the business of communicating messages by the electrical currents, and it is not

privileged to engage in another business; e. g., it could not engage in the operation of a railroad. It may, however, maintain the poles necessary for the prosecution of its business and if by constructing, in good faith, such a line of poles and wires as is necessary, it becomes possessed of space upon such poles, which it has no occasion to use, I see no objection to disposing of such space to other companies, which may be authorized to operate electrical conductors on poles in the street. Such a disposition of surplus space seems to be analogous to a sale of surplus material which may have been acquired in an honest effort to supply the actual needs of the company; or to leasing a room in a building owned by the company, which it does not need for its own purposes.

The company which has erected the poles has, however, no right to maintain them after they become unnecessary for its purposes; the company cannot by its contract of lease grant any right superior to its own right, in duration or extent.

The right or estate in the poles, which it conveys to its lessee by its contract of lease, is carved out of the right which it has acquired under the grant of its franchise. Therefore, when the right of the leasing company to maintain the poles ceases, the right of the lessee, being dependent thereon, must also cease.

It is therefore obvious that the answer to your first inquiry is that the agreement of a telegraph or telephone company with an electric light company for the use of its poles cannot bind or compel the city to permit the maintenance of the poles after the telephone or telegraph company has ceased to have the right to maintain them.

Your second inquiry as to "what degree or kind of contract must the electric light company make with the telephone or telegraph company to protect it in the use of such poles after they have become unnecessary for the business of the company which originally erected them," is perhaps sufficiently answered by that which I have above written.

It may perhaps be suggested that I have considered only the case of a leasing of space by the lighting company, upon poles which remain the property of the telegraph company, and that the relations of the lighting company to the poles may be materially different if the lighting company has actually purchased the entire property of the telegraph company in such poles.

I am unable to perceive, however, that a sale of the poles to the lighting company would confer any right as to maintenance; the right to maintain by the telegraph company ceases, when the poles become unnecessary; the telegraph company cannot by any form of conveyance confer any right superior to that which it possesses.

The sale of poles would transfer the property in them to the purchaser, but no right of maintenance would thus be created which would survive the day that they became unnecessary for the purposes of the telegraph company.

I remain, yours respectfully,

WM. H. CLARK, Counsel to the Corporation.

Mayor Grant offered the following resolution:

Resolved, That the application of the North New York Lighting Company, dated June 7th, 1889, to string two wires on Third avenue, 133d to 164th streets, Lincoln avenue, Third avenue to 133d street, 133d street, Third avenue to Alexander avenue,

138th street, Third avenue to Mott avenue, Cortlandt avenue, 146th street and Third avenue to 156th street, Rider avenue to 140th street and Third avenue, be denied.

Unanimously adopted.

Commissioner Gibbens: Mr. Mayor, from the report of the Engineer submitted at the last meeting, and laid over, I have drawn up a resolution in regard to the building of new electric light subways, which resolution I desire to offer. The red lines (referring to map) indicate the subways which have been built, and the black lines represent the subways which I have comprised in my resolution.

The Commissioner thereupon offered the following resolution:

Resolved, That the Secretary be directed to communicate with the President of the Consolidated Telegraph and Electrical Subway Company and direct the construction by that Company of subways for electric light and power conductors in the following streets and avenues:

In 42d street, from First avenue to Broadway;
In Broadway, from 14th street to Bowling Green;
In 59th street, from First avenue to Broadway;
In Third avenue, from 86th street to the Harlem River;
In 125th street, on the south side, from First avenue to Eighth avenue;
In Third avenue and the Bowery, from 14th street to Chatham Square.

The construction of the above to consist of iron tubes laid in hydraulic cement concrete; to include a distributing system on the top, consisting of a cast iron box to be placed at intervals of from twenty-five to fifty feet apart, into which the upper row of ducts will communicate, according to a plan on file with the Engineer of the Board; the number of ducts to consist in each of the above localities approximately of twenty: subject only to modifications by the Engineer of the Board of Electrical Control, and the work to be done under his direction. The Engineer of the Board is further directed to report to the Board at its next meeting and subsequent meetings as to the inception and conduct of the work.

(Passed as amended.—See amendatory resolution.)

Mayor Grant, addressing Engineer Kearny: Have you a report showing the electric light subways not yet actually completed?

Engineer Kearny exhibits a map showing portion of the subways ordered which has been completed, and

Leonard F. Beckwith, Chief Engineer of the Consolidated Telegraph and Electrical Subway Company, read to the Board the following statement:

NEW YORK, N. Y., June 26th, 1889.

MR. EDWARD LAUTERBACH, President, Consolidated Telegraph & Electrical Subway Company, 18 Cortlandt Street, New York, N. Y.:

DEAR SIR:—I beg leave to report to you the condition of advancement of the work on the electrical subways up to date:

First. Balance of work authorized by the Board of Electrical Control remaining over from previous years.

	Approximate Length of Ducts in Feet.	Lines Completed and in Progress. In Feet.
I. Telephone and Telegraph Subways,	40,000	10,000

These lines were authorized in 1888, but not completed, owing to the pressure of more important lines. The 53d street line and 45th street line are not included in the general plan for telephone subways laid out and asked for by the Metropolitan Telephone & Telegraph Company and will not be occupied by the telephone cables at all when their system is completed. All this work is prepared for and will be rapidly completed.

	Approximate Length of Ducts in Feet.	Lines Completed and in Progress. In Feet.
II. Electric Light Subways,	189,600	14,000

The greater portion of these lines, viz.: 124,200 feet belong to the 23d street subway, laid out in 1888 at the solicitation of the Safety Electric Light & Power Company, which was under negotiation to occupy the bulk of it. No other company has signified any desire to use it. After authorization, the Safety Company was not prepared to enter into an agreement to use the subways, and, as it was authorized at their request and for their benefit, its construction under these circumstances was postponed until nearer the time when the chief tenant would be ready to occupy it, and precedence in construction was given to other work. The material for these lines, which is largely special pipe with distributing cement shoulder ducts, except the 23d street line, is prepared, and the work will be completed in sections, as usual. It is now in progress.

	Approximate Length of Ducts in Feet.	Lines Completed and in Progress in Feet.
III. Edison Incandescent Lines,	136,440	10,000

These special Edison lines were chiefly authorized in 1887, the majority being for local distribution purposes in up-town cross-streets, and the understanding being that the work should progress, street by street, as the Edison Company was prepared to develop the field. This work is being progressed by the Edison Company, but should be excluded from considerations from the state of advancement of the subway work for the use of the general public.

SUMMARY OF BALANCE OF WORK.

Out of a total of 366,440 feet of unfinished work left over, from previous years, 136,440 is Edison work and to be considered apart. Of the remainder, 124,200 feet is the 23d street line, which will be started the moment that the chief customer is ready

to agree to use it, and will signify its desire to have the line built, which has not yet been done. The balance is 105,800 feet, of which 24,000 feet is nearly completed, leaving only about 80,000 feet to be done. This is now in progress and the materials ready.

Second. Work authorized in 1889:

	Approximate Length of Ducts in Feet.	Completed Feet.	In Progress Feet.
I. Telephone and Telegraph Subways,	265,000	115,000	110,000

All the materials for these lines is prepared and the work is progressing rapidly, showing a balance of only 45,000 feet not yet started.

	Approximate Length of Ducts in Feet.	Completed Feet.	In Progress Feet.
II. Electric Light Subways,	215,000	80,000	40,000

All the materials are prepared and the work is progressing rapidly, leaving a balance of 90,000 feet of ducts not yet started. These are all in the 29th street cross-town electric light line, laid out for the special accommodation of the necessities of the United States Illuminating Company, and, as authorized, consist chiefly of small $1\frac{1}{2}$ -inch ducts, which, if altered, as proposed, to the regular size of 3-inch ducts, the length of ducts to be completed would only be from 20,000 to 25,000 feet.

Third. In addition to the above, an aggregate of ducts laid by this Company in subway street crossings during 1889 amounts to about 15,000 feet, with about 15,000 feet of the same nature authorized by the Board of Electrical Control, but not completed. This work is of so pressing a character that it always takes precedence of other lines, the subsidiary connection of the subway tenants generally depending on its prompt completion.

Fourth. In addition to the above, this Company has built for subway tenants about 400 subsidiary connections, varying in length from 10 to 500 feet, with an aggregate length of ducts of about 20,000 feet.

From the foregoing it will be seen that the total subway work performed by this Company since starting in May amounts to about 250,000 feet, or about 50 miles. As this is about one-fifth of all the work done in 1888, the progress has been most satisfactory during the time named. Very truly yours,

LEONARD F. BECKWITH, Chief Engineer.

Mayor Grant offered the following resolution:

Resolved, That the communication of Leonard F. Beckwith, Chief Engineer of the Consolidated Telegraph and Electrical Subway Company, addressed to Mr. Lauterbach, its President, read by Mr. Beckwith at this meeting, be spread on the minutes.

Unanimously adopted.

The Board, together with Mr. Beckwith and Mr. Cohn, representing the Consolidated Company, Engineer Kearny and a representative of the New York Safety Electric Light and Power Company, discussed the communication of Mr. Beckwith with con-

siderable length, particularly as to the causes of delay in constructing and completing the electric light subways, Mr. Jackson, of the Safety Company, stating that his Company would be ready to occupy the 23d street subway within thirty days.

The Board also discussed the resolution of Commissioner Gibbens, authorizing and ordering subway construction for electric light and power service, Mayor Grant questioning Mr. Beckwith as to the time that would be necessary to complete that work, if ordered, together with the unfinished subways theretofore authorized, and Mr. Beckwith answering that it would take the balance of the season. Mr. Beckwith further stated:

"I am not prepared to say when Third avenue will be completed. That is an exceedingly long line, and, although you could attack it at different points, it will take the balance of the season."

Mayor Grant: Make some statement as to what you mean by the "balance of the season"?

Mr. Beckwith: The balance of the season terminates about the first of December. It probably might be done by that time.

Mayor Grant: Will you have it completed in five months?

Mr. Beckwith: I cannot promise, Mr. Mayor.

Mayor Grant: You must know something about it?

Mr. Beckwith: We will do our best to complete it.

Mayor Grant: When will you do it?

Mr. Beckwith: There are different considerations that will affect the length of time necessary to complete that work. The materials, the meeting of rock in the conducting of the work, the amount of other work which the Board may order which will have to be carried on simultaneously, and which, from indications, is very considerable—all those questions will affect the completing of that work within a specified time. Until we know absolutely with regard to the rock, with regard to the large amount of material to be put in that work, it would be imprudent to state any specified time. If it is desired that that work should take precedence of other work that will greatly facilitate it.

Mayor Grant: Mr. Bernheim, of the Manhattan Electric Light Company, asked me for a permit to build a subway on Madison avenue. He would rather take Fifth avenue, but as that avenue had just been repaved, and Madison avenue was going to be torn up, it was the best thing to do.

Mr. Kearny: He never said anything to me about that. Fifth avenue is the street named in the request made to me. He wrote me he wanted Fifth avenue.

Commissioner Hess: He might just as well want Fifth avenue as Madison avenue.

Mayor Grant: One is ordered to be paved by the city, and the other has just been paved at a big expense.

Mr. Cohn (representing the Subway Company): If your Honor will pardon a suggestion on the part of the Subway Company: Your Honor wants these subways built according to a system, which is the only successful way they can be built. There are wants expressed to the Board at various times by various companies—

Mayor Grant: Mr. Bernheim wrote a letter here in which he expressed this. Mr. Bernheim has been very frank about it. He came here and wrote that letter and told me he could not get those subways built.

Mr. Cohn: In our experience there are those various applications. We want the Board to be master. If the wants of the various companies could be ascertained, and then the Company could determine for itself which would be the best general system to lay out, we would know how to accomplish the best results in the shortest time. It is a large problem, which, I think, means considerable study. It has shown itself so to the Construction Company in building, and, if your Honor will investigate, it will show itself to you.

Commissioner Hess: I do not think it is fair that because a company wants a subway laid in a certain street or avenue that we should direct the Construction Company to build it. We ought to build subways so as to accommodate all the companies, wherever there is the largest number—not to help the Manhattan Company or any other company.

Mayor Grant: I want to say this: I have no more admiration for the Manhattan Company than for any other company. I have sent their case over to the District Attorney. But when they come here and make an application for a subway, north and south, to do their business, and they say they are perfectly willing to build it, the Construction Company should build it or they should be allowed to do it.

Commissioner Gibbens: They may know their business, but they don't know ours.

Commissioner Hess: They came to you and complained, and never said anything to any other member of the Board.

Mayor Grant: Oh, yes, they did.

Commissioner Hess: I mean proffered their complaint to you. We gave them every facility we could.

Mayor Grant: That letter is on file. They did not do anything to my mind—they have done nothing except that which I consider honorable in the matter.

Gentleman (representing U. S. Ill. Co. and N. Y. Safety Electric Light and Power Co.): As your Honor doubtless knows, we are desirous of going underground, are willing to go underground wherever we can go, and desire to put ourselves on record. We do not think we have been offered by the present Subway Company, or whatever you call it, sufficient facilities to get underground. I want to call your attention to the

fact that one electric light company in this town is allowed to build its own subways and go wherever it pleases. We will be glad to do the same. The Edison Company goes where it pleases; it has built a subway part way up Madison avenue; it has distributing ducts on Sixth avenue.

Commissioner Hess: You do not mean that.

Gentleman: They build almost where they please. They build and make their own house connections. It has happened more than once where we had a contract to supply a place we had to wait four or five weeks to supply our customer, and the Edison Company having its own permit—

Commissioner Gibbens: The Edison Company has not a permit.

Gentleman: I wish to say in behalf of my companies that if we are accorded the same privileges we will build subways for our own use.

Mayor Grant: I am frank to say that the thing of giving every company the right to build subways is out of the question.

Gentleman: The Edison Company has it.

Mayor Grant: I don't believe in that. As for giving every company the right to build a subway—that would be the most ridiculous thing in the world.

Commissioner Gibbens: If the Construction Company has in any way given the Edison Company any function or any privileges which it won't give anybody else, or if it has allowed it to do just precisely as it pleases in a manner it won't allow other companies, I think we ought to know it.

Gentleman: I am complaining against the Construction Company.

Commissioner Gibbens: And I think we ought to know it immediately.

Commissioner Hess: Do you know of the Edison Company having built a subway of its own not authorized by this Board?

Gentleman: I don't suppose it has. It is allowed to make its connections when it pleases.

Commissioner Hess: Have you made a request to this Board to have subways laid in streets that has been refused?

Gentleman: I don't know as our request has been refused. I don't complain of the Board, Mr. Commissioner.

The Board hereupon further considered the matter of the delay in the construction and completion of electric light subways, Mayor Grant questioning Mr. Cohn, of the Construction Company, in regard to it, and complaining to him of the want of diligence shown by his Company.

Mayor Grant: How long will it take you to construct this subway on Third avenue from the Bridge down to Chatham Square?

Mr. Beckwith: It will take the balance of the season.

Mayor Grant: Will you do it in the season?

Mr. Beckwith: Yes, sir.

Mayor Grant: This is all to be constructed.

The Board then, in connection with that part of Commissioner Gibbens' resolution referring to the material to be used in the construction of the subways therein ordered, took up the consideration of a communication from the United States Illuminating Company, dated June 11th, 1889, requesting the Board to adopt the cement-lined conduits for the ducts which are to be used for electric light and power subways.

Mayor Grant (addressing a representative of U. S. Co.): You want a patent system—there is a patent on it?

Gentleman (representing U. S. Co.): It is a cement-lined pipe. We want it because we think it is better for our purpose. It has a better insulation.

Commissioner Hess: Are there no representatives of the other companies here?

Mr. Speers (of the Brush Electric Ill. Co.): We have determined to use such conduits as are laid for us. This question of particular conduits we have not examined into.

Engineer Kearny: In certain places it would not be possible to use it; in certain other places we could use it.

Mayor Grant: Is it more costly?

Mr. Beckwith: The price of the cement conduit is about the same as the iron, so far as I know. We have not been able to ascertain very accurately about the distribution; that appears to be considerably higher. In regard to the use of the iron pipe, everybody will admit it has proved satisfactory; cement pipe—I do not know where it has been tested for electric light purposes.

Commissioner Gibbens: Is any company or any firm interested in having the iron pipe laid in cement?

Mr. Beckwith: No, sir.

Commissioner Gibbens: Is any company or firm interested in having this patent form laid in the city?

Mr. Beckwith: Yes, sir; I understand so.

Gentleman (representing U. S. Ill. Co.): It is; we are interested in that pipe.

Commissioner Hess: Have you ever used it anywhere?

Mr. Jackson (President of U. S. Co.): We have used it in a number of places—in Chicago—for arc lighting. I took hold of that cement-lined pipe here in New York because, to my mind, it presented the best that had come before me for that purpose. I said to Mr. Lauterbach that we would give the Construction Company the patent. There are two or three hundred thousand feet used by the Fire Department.

Commissioner Moss: Is it not used in Church street?

Engineer Kearny: Yes, sir.

Commissioner Moss: Don't iron pipe rust?

Engineer Kearny: Yes, sir.

Mayor Grant: This resolution of Commissioner Gibbens provides for a certain kind of a subway. For my part, I want to say that if the cement-lined subway is better I would not like to be bound by having this other kind of subway left in. While I have no reason to suppose that the kind of subway provided for in the resolution is not better than the one proposed by the United States Company, if the City of New York can get the advantage of a patent—

Commissioner Gibbens: If there is an advantage.

Mayor Grant: I believe we ought to avail ourselves—

Commissioner Gibbens: If there is an advantage, we ought to have known it long ago.

Gentleman (representing U. S. Co.): We have urged it before.

Commissioner Gibbens: We don't agree with you.

Mr. Cohn: With regard to that, the material that we have ordered is largely of the character specified in the resolution.

Mayor Grant: How much is ordered?

Mr. Beckwith: About 250,000 feet.

Mayor Grant: Before you order any more—do not order any more until, perhaps, this Board has an opportunity of saying something about it.

Mr. Beckwith: The 23d street line, which was authorized to be constructed last year with cement pipe, the Construction Company proposes to build with that material.

Mayor Grant moved to amend the resolution offered by Commissioner Gibbens (the Commissioner accepting the amendment), so as to include the whole of Third avenue, and so as to read as follows:

Resolved, That the Secretary be directed to communicate with the President of the Consolidated Telegraph and Electrical Subway Company and direct the construction by that Company of subways for electric light and power conductors in the following streets and avenues:

In 42d street, from First avenue to Broadway;

In Broadway, from 14th street to Bowling Green;

In 59th street, from First avenue to Broadway;

In the Bowery and Third avenue, from Chatham Square to the Harlem River;

In 125th street, on the south side, from First avenue to Eighth avenue:

the construction of the above to consist of iron tubes laid in hydraulic cement concrete;

to include a distributing system on the top, consisting of a cast iron box to be placed at intervals of from twenty-five to fifty feet apart, into which the upper row of ducts will communicate, according to a plan on file with the Engineer of the Board; the number of ducts to consist in each of the above localities approximately of twenty; subject only to modifications by the Engineer of the Board of Electrical Control, and the work to be done under his direction. The Engineer of the Board is further directed to report to the Board at its next meeting and subsequent meetings as to the inception and conduct of the work above ordered.

Unanimously adopted.

Intermediate the offering of this amendatory resolution and the putting of the motion on the question of its adoption, Mr. Beckwith stated,

Mr. Beckwith: With regard to the question of completing this work—the whole of Third avenue by the 1st of December—I think that the Engineer of the Subway Company and the Subway Company should not be held too strictly to that date.

Mayor Grant: Oh, yes.

Mr. Beckwith: I think it may be possible.

Mayor Grant: You stated it would be possible. This work (addressing Mr. Cohn) that is to be directed, you are to have that completed by the first of December, as stated in Mr. Beckwith's statement to me.

Commissioner Gibbens offered the following resolution:

Resolved, That a copy of the resolution providing for the increase of the office force and for the appointment of Inspectors of Subway Construction, introduced at a meeting of the Board, held June 13th, 1889, and laid over for its consideration, be sent to the Consolidated Telegraph and Electrical Subway Company and to each of the electrical companies, accompanied by a communication inviting them to make objection to the proposed increase of expense, on the ground that it is not necessary, if it so seems to them.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That the application of the Western Union Telegraph Company, dated June 25th, 1889, to run five wires on existing poles from McComb's Dam Bridge to 154th street and Eighth avenue, for the purpose of making connection with the New Base Ball Grounds, be laid over until the next meeting.

Unanimously adopted.

The following communication from the Consolidated Telegraph and Electrical Subway Company was read:

NEW YORK, N. Y., June 15th, 1889.

To the Honorable, the Commissioners of the Board of Electrical Control, Hon. HUGH J. GRANT, President, 1266 Broadway, New York, N. Y.:

GENTLEMEN:—We herewith beg leave to submit for your approval and authorization the following line of electrical subways, for construction during the present season, and for which we desire your favorable consideration, viz.:

A telephone and telegraph subway from a manhole on the north side of Broad street at the intersection of Exchange Place to manhole at intersection of Wall street, thence across Wall street to manhole at intersection of Nassau street, thence on the south side of Nassau street to manhole at intersection of Pine street.

The construction of this subway will consist of wrought iron pipe laid in hydraulic cement concrete, and is applied to meet the special requirements of the Metropolitan Telephone and Telegraph Company, which has applied for subway facilities in this vicinity.

The map showing the location of the above subway is filed herewith.

Very respectfully,

EDWARD LAUTERBACH, President.

Mayor Grant offered the following resolutions:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorize to construct, during the present season, a telephone and telegraph subway from a manhole on the north side of Broad street at the intersection of Exchange Place to manhole at intersection of Wall street, thence across Wall street to manhole at intersection of Nassau street, thence on south side of Nassau street to manhole at intersection of Pine street; construction to consist of wrought iron pipe laid in hydraulic cement concrete.

Unanimously adopted.

Resolved, That applications of the United States Illuminating Company, as follows:

One, dated June 21st, 1889, to connect with its circuits, 197 Bowery, 320 Eighth avenue, 513 Eighth avenue, 522 Broadway, 814 Broadway, 349 Canal street, 127 Bowery, 231 Eighth avenue and 242 Grand street;

One, dated June 22d, 1889, to connect with its circuits, 237 Fulton street, 265 Bowery, 342 Canal street, 209 Bowery, 815 Broadway, 64 East 4th street, 246 Grand street, 231 Bowery, 193 Bowery;

One, dated June 17th, 1889, to connect with its circuits, 519 Second avenue, 108 Avenue B, 297½ Broadway, and 1½ Second avenue, 318 East Houston street and 490 Eighth avenue;

One, dated June 15th, 1889, to connect with its circuits, 419½ Grand street, 185 Chrystie street, 88 Second avenue, 55 Avenue B, 281 Bowery, 273 to 277 Broadway, 163 Third avenue and 117 Chambers street;

One, dated June 14th, 1889, to connect with its circuits, 119 Bowery, 172 Fulton street and 49 Broadway;

One, dated June 20th, 1889, to connect with its circuits, 75 Chambers street, 328 East Houston street, 75 Park Row and 327 Grand street;

One, dated June 19th, 1889, to connect with its circuits, 1799 Greenwich street, 223 Bleecker street, 266 Fourth avenue, 129 Bowery and 218 Bowery;

One, dated June 17th, 1889, to connect with its circuits, 77 Liberty street, 440 Third avenue, 411 Broadway, 641 Broadway, 261 Sixth avenue, 272 Bleecker street, 130 West 23d street, 110 Vesey street, 187 Bowery and 231 and 233 Bowery;

One, dated June 24th, 1889, to connect with its circuits, 437 Broadway, 858 Third avenue, 156 3d street and 782 Eighth avenue;

One, dated June 25th, 1889, to connect with its circuits, 848 Broadway, 462 Broadway and 183 Third avenue;

One, dated June 13th, 1889, to hang eight lamps on existing lamp-posts, in West Stuyvesant Square, city lighting, as per order of Board of Public Works, wires already run;

One, dated June 17th, 1889, to connect with cables from subway within building at No. 362 to lamps hanging outside of and attached to buildings in same block at Nos. 360, 362, 364, 366 and 368 Sixth avenue;

One, dated June 17th, 1889, to change connections for lamps from one circuit to another circuit, on same pole line, in front of same premises, now supplied by present connections, at the following places: 522 Broadway, 535 Broadway, 5 Barclay street, 3 Barclay street, 351 Broadway, 383 Broadway, Canal street and Broadway, 233 Broadway, 377 Broadway and 231 Broadway;

One, dated June 20th, 1889, to change connection for lamps from one circuit to another circuit, on same pole line, in front of same premises, now supplied by present connections, at No. 1 East 30th street;

To change connections for lamps from one circuit to another circuit, on same pole line, in front of same premises, now supplied by present connections, at the following places: Corner of Houston and Bowery, 274, 268, 266, 256, 260, 202, 200, 172, 134, 126, 273, 237, 187 and 135 Bowery, 17 Rivington street, corner Stanton and Chrystie street;

One, dated June 25th, 1889, to change connections for lamps from one circuit to another circuit, on same pole line, in front of same premises, now supplied by present connections, at No. 46 East 14th street,

be granted.

Unanimously adopted.

Resolved, That applications of the United States Illuminating Company, as follows:

One, dated May 25th, 1889, to erect new support poles in place of old ones, which have become decayed, split and cut away by trucks, at 54 Cliff street and fourteen other places therein designated;

One, dated May 25th, 1889, to erect new support poles in place of old ones, which

have become decayed, split and cut away by trucks, at 82 Duane street and fourteen other places therein designated;

One, dated May 25th, 1889, to erect new lamp-posts for city lighting in the district covered by this company, in place of old ones, which have become decayed, cut away and out of plumb, northeast corner West 11th street and 13th avenue, pole No. 45 South street, between Jefferson and Clinton streets;

One, dated May 16th, 1889, to erect two support poles on Pier 23, North River, and run two wires thereon, for the purpose of serving the Steam Heating Company with electric lamps at its coal dock;

One, dated June 12th, 1889, to remove two support poles on the east side of Bleecker street, north of Bank, from the middle of sidewalk, and reset on curb line;

One, dated June 15th, 1889, to erect a new support pole in place of old one, which has become decayed, split and cut away by trucks, at Hanover and Exchange Place, be denied.

Unanimously adopted.

Resolved, That applications of the Manhattan Electric Light Company, Limited (being for lamp connection only), as follows:

One, dated June 26th, 1889, to connect existing lines with 320 Eighth avenue;

One, dated June 25th, 1889, to connect existing lines with 351 Eighth avenue and 183 Sixth avenue;

One, dated June 25th, 1889, to connect existing lines with 1504 First avenue, 1542 First avenue and 2378 Third avenue;

One, dated June 21st, 1889, to connect existing lines with 272 Eighth avenue and 1528 First avenue;

One, dated May 30th, 1889, to connect existing lines with 77 and 79 Bowery, be granted.

Unanimously adopted.

Resolved, That applications of the Harlem Lighting Company (being for lamp connections only), as follows:

One, dated June 21st, 1889, to connect existing lines with 2320 Third avenue and 2150 Third avenue;

One, dated June 26th, 1889, to connecting existing lines with 207 East 120th street;

One, dated June 24th, 1889, to connect existing lines with 1528 First avenue, 1561 First avenue and 2150 Third avenue;

One, dated June 17th, 1889, to connect existing lines with 1434 Third avenue; and

One, dated June 26th, 1889, to connect existing lines with 1556 First avenue, be granted.

Unanimously adopted.

Resolved, That applications of the Mount Morris Electric Light Company (being for lamp connections only):

One, dated June 25th, 1889, to connect electric lamps with circuits, at 215 Washington street, 57½ Dey street and 162 Reade street; and

One, dated June 20th, 1889, to connect electric lamps with circuit at 57 and 69 Dey street,

be granted.

Resolved, That applications of the Brush Electric Illuminating Company, as follows:

One, dated June 17th, 1889, to connect electric lamps at 277 Grand street;

One, dated June 20th, 1889, for overhead connections at 92 Bowery, 53 Bowery and 263 Sixth avenue;

One, dated June 25th, 1889, for electric light connections at 102 Bowery, 300 Eighth avenue, 439 Third avenue, 301 Grand street and 457-9 Broome street; and

One, dated June 20th, 1889, for overhead connections at 272 Eighth avenue, 141 East 17th street, 253 Sixth avenue, 143 Fourth avenue and 40 Bowery, being for lamp connections only, be granted.

Unanimously adopted.

Resolved, That applications of the Metropolitan Telephone and Telegraph Company, as follows:

To run a wire from 52 New to 53 New street;

To run a wire from 510 West 30th street to Pier 62, North River;

To run a wire from Exchange at 132 East 125th street to foot of West 13th street, North River;

To run a wire from Harlem Exchange, 132 E. 125th street to 157 E. 125th street;

To run a wire from Exchange at 132 E. 125th street to 771 E. 165th street;

To run a wire from 132 E. 125th street to 155th street and Tenth avenue;

To run a wire from 132 E. 125th street to 245 W. 125th street;

To run a wire from 132 E. 125th street to 202 W. 125th street;

To run a wire from 132 E. 125th street to corner Walton avenue and Cheever Pl.;

To run a wire for the Department of Charities and Correction from Harlem Exchange at 132 E. 125th street to the residence of Edward C. Sheey, No. 8 W. 125th street, to be used as a telephone line by him;

To run a wire from Drexel Building to 32 Nassau street;

To run a wire from 29 Broadway, its underground terminal, to 24-5 West street, housetop;

To run a wire from 132 E. 125th street to 120th street and Eighth avenue;

To run a wire from 203 E. 124th street to its Exchange at 132 E. 125th street;

To run a wire from 132 E. 125th street to 125th street and Lexington avenue;

To run a wire from 14th street and Sixth avenue, its underground terminal, to 428-30 W. 15th street;

To run a wire from 18th street and 4th avenue, its underground terminal, to 30 Union Square;

To run a wire from its underground terminal at 58th street and Third avenue to 61st street and East River;

To run a wire from its underground terminal at 58th street and Eighth avenue to 59th street and North River;

To run a wire from underground terminal at 58th street and Eighth avenue to 89th street, and Tenth avenue;

To run a wire from Spring street and West street, its underground terminal, to W. Washington market;

To run a wire from Spring street and West street, its underground terminal, to 9 Gansevoort street;

To run a wire from Spring street and West street, its underground terminal, to West Washington Market;

To run a wire from Spring and West streets, its underground terminal, to corner Jane and West streets;

To run a wire from underground terminal, 58th street and Eighth avenue, to 210 W. 89th street;

To run a wire from its underground terminal at 18th street and First avenue to 502 E. 17th street;

To run a wire from 415 W. 32d street to our underground terminal on the corner of 32d street and Sixth avenue;

To run a wire from its underground terminal at 27th street and Sixth avenue to 556 West 27th street;

To run a wire from its underground terminal at 18th street and Seventh avenue to 509 West 15th street;

To run a wire from its underground terminal at 58th street and Third avenue to 439 E. 80th street; and

To move a pole now standing in front of building Nos. 3, 5 and 7 New street to the building line about fifteen feet north of its present location, it being necessary to be done owing to excavations which are being made at that place,

be granted.

Unanimously adopted.

On motion of Mayor Grant, a number of applications of the Metropolitan Telephone and Telegraph Company were laid over.

Resolved, That applications of the United States Illuminating Company, as follows:

One, dated June 17th, 1889, to replace on its 55th street pole line one wire from

Madison avenue to Sixth avenue, which was stolen when temporarily out of service owing to the removal of poles and wires on Broadway and Sixth avenue, and being now needed to make subway connections;

One, dated June 19th, 1889, to run one wire across Bowery at Grand street, and to run one wire a portion of the block between Broadway and Crosby street, on Grand street, both wires being required to replace wire removed without its knowledge, and being necessary to make circuit complete, and essential to its business; and

One, dated June 19th, 1889, to place four wires on its own poles on West street from Fulton street to Cortlandt street, permit No. 1,732 covering this work having been cancelled with other permits,

be denied.

Unanimously adopted. (On motion of Mayor Grant.)

Mayor Grant moved the following resolutions:

Resolved, That the Permit issued to the Manhattan Electric Light Company, dated February 25th, 1889, and numbered 2616,

"To complete the construction of the electric light lines on First avenue, and to that end to erect the necessary poles and string the necessary wires, the line being intended to connect electrical station, 80th street and Avenue B, with subway on Broadway and Sixth avenue. This permit, however, being granted with the understanding and on the condition that the Company allow no other company to string its wires on these poles so to be erected unless upon the express permission of the Board of Electrical Control given to such other company so to do in consideration of its taking down other poles belonging to it,"

be revoked.

Unanimously adopted.

Resolved, That applications of the East River Electric Light Company, as follows:

One, dated June 25th, 1889, to connect electric light wires with circuits, at 257 East 10th street, 64 Essex street, 570 Second avenue, 65 East 13th street, 265 Bowery, 307 Third avenue, 355 Grand street, 55 Third avenue, 277 Bowery, 206 Grand street, 451 Third avenue, 354 Grand street, 633 Third avenue, 1114 Third avenue; and

One, dated June 20th, 1889, to connect electric lamps with existing circuits, at 145 Avenue A, 113 Avenue B, 482 Fourth avenue, 957 Third avenue, 219 Sixth avenue, 1325 Third avenue, 438 Second avenue, 4 St. Marks Place, 387 Fourth avenue, Union Square Bank, Union Square, between 14th and 15th streets,

being for lamp connections only, be granted.

Unanimously adopted.

Resolved, That applications of the East River Electric Light Company, as follows:

One, dated June 24th, 1889, to erect seven poles between Brooklyn Bridge and Ann street, on Park Row, for city lighting, and to string wires thereon, application being made in consequence of the cutting of its wires on Western Union Company poles and of the fact that there is no subway in Park Row;

One, dated June 24th, 1889, to string the wires on existing poles from Grand and Orchard streets through Grand to Essex and Broome street;

One, dated June 24th, 1889, to string one wire on existing poles from southwest corner of 24th street and Third avenue to Grand street and Bowery;

One, dated June 24th, 1889, to string one wire on existing poles from southwest corner of 28th street and Third avenue to southwest corner of 42d street and Third avenue;

To substitute small support poles on Tenth avenue, between 15th and 59th streets, for the purpose of city lighting, in place of large ones now standing, while awaiting construction of conduits; and

One, dated May 31st, 1889, to string two wires on existing poles of the Brush Electric Light Company from 6th street and Bowery to 4th street, through 4th street to Second avenue,

be denied.

Unanimously adopted.

On motion of Commissioner Moss, the Board adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, August 15th, 1889, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioner Jacob Hess, Commissioner Daniel L. Gibbens, Commissioner Theodore Moss.

Commissioner Gibbens offered the following resolutions:

Resolved, That the reading of the minutes of the last meeting be dispensed with.
Unanimously adopted.

Resolved, That the communications to the Board be read.

The following communication of the Consolidated Telegraph and Electrical Subway Company was read:

[AUGUST 15, 1889.]

NEW YORK, N. Y., July 9th, 1889.

To the Honorable, the Commissioners of the Board of Electrical Control, Hon. HUGH J. GRANT, President, 1266 Broadway, New York, N. Y.:

GENTLEMEN:—We beg to submit herewith for your approval and authorization the laying of special ventilation pipes or ducts on the streets named below, to carry the compressed air from the pressure blowers situated in the basements of buildings to adjacent manholes which we have selected as the most available for distributing the air to the neighboring subway lines. This work is similar to that we have laid at Broadway and 38th street in connection with the pressure blower placed in the Marlborough Hotel and serving the electric light subways on Broadway and Sixth avenue.

1st. In Cortlandt street, a pipe to extend in each direction from the manhole in front of the building of the Metropolitan Telephone & Telegraph Company, in the basement of which the pressure blower is situated, to the manhole of the telephone and telegraph subway on the west side of Broadway and to the manhole on the west side of Church street. These pipes will carry the air for distribution to the telephone and telegraph subways on Broadway and Church street, etc., and adjacent branches.

2d. On 38th street a pipe extending from the manhole in front of the Metropolitan Telephone and Telegraph Company's building, in the basement of which the pressure blower is situated, each way to the manhole on the east side of Sixth avenue and to the manhole on the east side of Broadway. These pipes will distribute the air to the telephone and telegraph subways on Sixth avenue and Broadway.

This work is to be proceeded with immediately and it is expected that it will greatly facilitate the ventilation of the subways mentioned.

Very truly yours,

EDWARD LAUTERBACH, President.

The following communication from the Adams Express Company was read:

JULY 1ST, 1889.

THEODORE MOSS, ESQ., Broadway and 30th street:

DEAR SIR:—Agreeably to your suggestion, I enclose copies of letters, etc., with reference to metallic circuit private line telephone of Adams Express Company running from 59 Broadway to Jersey City Depot (Penn. R. R.), 309 Canal street (N. Y.), 684 Broadway, 12 W. 23d street, 40 E. 42d street and Lexington avenue and 48th street. At 59 Broadway we have a miniature "exchange." I cannot obtain copy of the application made by the Metropolitan Telephone Co., although it was at one time promised.

Very respectfully,

H. H. GATES.

Commissioner Gibbens moved the following resolution:

Resolved, That the matter of the communication of the Adams Express Company, dated July 1st, 1889, read at this meeting, be referred to the Expert.

Unanimously adopted.

The following communication from the Brush Electric Illuminating Company was read:

NEW YORK, July 23d, 1889.

The Hon. The Board of Electrical Control, 1266 Broadway, New York City:

GENTLEMEN:—As we informed Mr. Commissioner Gibbens yesterday, in accordance with his directions of the 20th inst., we discontinued our underground service in this City, and made an investigation of the condition of our cables, from which it appears that all that we have had in use are in perfect order, their insulation being largely in excess of the requirements of the Subway Company and of your Board. Occasion was taken to couple the fact of an explosion in the subway with that of a ground in one of our circuits. Upon investigation the leak in our cable was found a few feet from the manhole at 14th street and University Place, between that and the connection to our aerial lines, the rest of the cables including that part in the 20th street manhole testing up to 673 Megohms, showing conclusively that the so-called ground had nothing whatever to do with the explosion, and also that the cable had not been subjected to any improper strain. Explosions in the subway have occurred when no current was being passed through the cables; grounds in the cables have occurred when there were no explosions; and no grounds and explosions have occurred simultaneously.

Of course it is not in the power of this Company to learn officially the conditions of the cables operated by other companies—their imperfections and accidents, but it is evidenced by the repeated calls upon the experts of the Board of Control and the Subway Company, that this Company is not the only one whose cables have failed. If we have had more interruptions to our service, it can readily be accounted for by the fact that we have a larger number of circuits, a greater length of cable, and are lighting more lamps through the subway.

In perfect good faith and at large expense we have laid cables in the subway, and at the time of discontinuing service had over 12 miles in operation. As the condition of our cable before and after its discontinuance, in accordance with the directions of Commissioner Gibbens, was perfect and met all legal requirements, we would advise you that we hold the Board of Electrical Control responsible for all direct and contingent damages sustained by this Company through the interruption to its service under the order of the 20th inst.

Very truly yours,

BRUSH ELECTRIC ILLUMINATING CO.

G. McFALL, Sec'y.

Commissioner Gibbens: I have evidence to show that the cable of the Brush Electric Illuminating Company was not in order, and I move:

Resolved, That the communication of the Brush Electric Illuminating Company to the Board, dated July 23, 1889, lie on the table without action.

Unanimously adopted.

The following other communication from the Brush Electric Illuminating Company was read:

NEW YORK, July 25th, 1889.

HON. THEODORE MOSS, Secretary, 1266 Broadway, New York City:

SIR:—We have your favor of 24th inst., referring to the removal of our City Circuit on 59th street, and in reply would state that this Company did not receive any written or official notice whatever regarding the 59th street poles and wires. Your Inspector, Mr. Keyes, incidentally spoke of the matter to our Mr. Spear, who informed him that we would examine into the matter and advise him whether they were necessary for the proper running of our system; and our foreman, Mr. Siers, who was directed to take charge of the matter, was informed by Commissioner Gibbens that no action would be taken regarding these poles until after the award of contracts for lighting City lamps. The lighting of the City lamps was awarded to us on the 16th inst., and within two hours from that time our poles and wires were removed. The poles and wires were not dead or not in use within the meaning and intent of the rules and regulations of your Board, and we, therefore, respectfully request that they be replaced free of all expense to this Company, in order that we may comply with our contract with the City of New York for lighting the public lamps.

Very respectfully yours,

BRUSH ELECTRIC ILLUMINATING CO.

W. T. MOORE, President.

Commissioner Gibbens stated, in reference to the communication of the Brush Company, that its 59th street poles were regularly and properly removed by the Bureau of Incumbrances, not then being in use, and having been "dead" for more than a year prior thereto, and offered the following resolution:

Resolved, That the communication of the Brush Electric Illuminating Company, dated July 25th, 1889, in reference to the removal of its circuit on 59th street, lie on the table without any action whatever.

Unanimously adopted.

The following communication from the Fire Department was read:

NEW YORK, August 3d, 1889.

Hon. Board of Electrical Control, No. 1266 Broadway, New York City:

GENTLEMEN:—The line of telegraph poles on the east side of Eighth avenue, between 65th street and 125th street, from which the wires of the Western Union Telegraph Company have been removed, are carrying the wires of this Department.

The Western Union Company are willing to transfer the ownership of the poles to this Department.

As these poles are necessary for the service of the Fire Department, I respect-

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fully request the necessary authority from your Board to enable the Western Union Company to make the transfer under the rules of your Board.

An early reply is respectfully requested.

Very respectfully,

J. ELLIOT SMITH, Superintendent.

Commissioner Gibbens offered the following resolution:

Resolved, That permission in accordance with the request contained in the communication of the Fire Department, dated August 3d, 1889, be granted to that Department.

And, after some discussion, Mayor Grant particularly objecting, withdrew his resolution, whereupon

Mayor Grant moved the following:

Resolved, That the Secretary be directed to write a letter to the Fire Department and give it permission to continue in the use of the line of telegraph poles on the east side of Eighth avenue between 65th and 125th street now carrying its wires.

Unanimously adopted.

The following application was read:

NEW YORK, July 22, 1889.

Permission is hereby requested by The Metropolitan Telephone and Telegraph Company to string ten wires from underground terminal, 58th street and Third avenue to Harlem River, via Third avenue, as per diagram, for use of the American Telephone and Telegraph Company, for Boston wire.

THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.,

W. A. VAIL, Gen'l Sup't.

Mayor Grant stated, in connection with the application of the Metropolitan Telephone and Telegraph Company, that employees of that Company have been continually stringing wires for private telephones on the long distance line running through 73d street, and that the Company in applying for these long distance lines had represented them to be exclusively for long distance telephoning. He questioned Manager Eckert, of the Metropolitan Company, at some length in regard to this, and, not receiving a satisfactory explanation, offered the following resolution:

Resolved, That all applications of the Metropolitan Telephone and Telegraph Company now before the Board be laid over until such time as the Company shall give the Board a written statement in regard to the stringing of wires for private telephones on long distance telephone lines represented by it as exclusively for that purpose.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated July 29, 1889, to run a wire from its underground terminal at 21st street and Broadway to 17th street and East River, for telephone for Department of Docks, be granted, subject, however, to such restrictions as Expert Wheeler shall put upon the Company as to the use of existing subways in making the connection.

Unanimously adopted.

Commissioner Gibbens submitted the following Report:

To the members of the Board of Electrical Control,

GENTLEMEN:—Your Committee, appointed for the purpose of drawing up a report upon the investigation made of the explosions in the electrical subways at the corner of 23d street and Fifth avenue, desiring to be brief and, at the same time, fairly to state the facts bearing upon the subject and remedies which seem to be necessitated by the condition of the streets in the city of New York underground, omit any long or exhaustive summing up of the details of the investigation and the testimony heard, and respectfully report as follows:

THE EXPLOSIONS AT 23d STREET.

The explosions at 23d street were caused by the rapid accumulation of illuminating gas in the manholes of the electrical subway from a leak in the gas mains adjacent thereto, which illuminating gas was ignited presumably by a spark resulting from the atmospheric differences of temperature or by a flame carried backward through the distributing duct leading from the subway into the cellar of a store in the Fifth Avenue Hotel building, which distributing duct had been left unclosed. It does not appear that the explosions were caused by any leak from the electrical conductors in the subway, inasmuch as the evidence before the Board shows that no current had been turned on these conductors at the time of the explosion.

The important conclusion derived from the investigation, therefore, is that such explosions are primarily due to escape of gas, and may occur as well in the telephone and telegraph subway as in the electric light subway, and may also occur in sewers, house vaults, or other confined spaces in which illuminating gas may accumulate.

This conclusion is supported by the following additional facts arrived at in the course of the investigation:

First. Other subway manholes have exploded in which no electrical conductors were being operated at the time of the explosion.

Second. Four explosions in the sewers have taken place during the last year.

Third. Explosions in the sewers have occurred in other cities from the escape of illuminating gas, notably, very recently in Philadelphia and in London.

Fourth. Violent explosions destroying houses have occurred in Pittsburg from accumulations of natural gas.

VENTILATION OF SUBWAYS.

It appears that the engineers in charge of the construction of subways in the city of New York have recognized the fact that the accumulation of illuminating gas, from defective gas pipes, in the manholes, was likely to be a serious menace to the successful operation of electrical conductors underground, and have considered the subject in all its bearings. It has been their aim to exclude the gas from the manholes, as far as possible, by constructing them of solid masonry; and, upon finding that even this would not answer, inasmuch as the gas creeps in through the place where the iron casting forming the manhole cover rests upon the masonry of the manhole, they discussed and attempted means of ventilation.

The different methods of ventilation may be divided into four classes, as follows:

1. By means of openings in the manhole covers. This is objectionable by reason of the fact that a horse passing above the manhole, or a carelessly thrown stump of a cigar or cigarette, or the dropping coals from a passing fire engine, may ignite the gas issuing from the holes in the manhole, thereby causing the very catastrophe it is desired to prevent. This method of ventilating manholes has been attempted in Chicago with most serious results.

2. By means of a gas jet in the manhole itself kept constantly burning near the bottom and a vent through which the current of air thereby excited can escape. This is objectionable, because a sudden leak in a manhole of a defective gas pipe—such as the one in 23d street, where the manhole became sufficiently full of gas in a very short period to explode—would result in a blow-out.

3. By means of vents from the top and bottom of the manhole terminating at different altitudes, so that the difference of temperature may excite a current passing in through the one vent and out through the other, which current may be accelerated by means of patent ventilators placed upon one of the vents. This has been tried, by direction of the Board of Electrical Control, on Broadway, and, while a certain slight current is excited, which might be satisfactory under ordinary circumstances or in some particular place, it is not sufficient to meet the requirements of the subways everywhere or in all cases.

4. By means of blowers or air compressors, by which the gas is forced out of the subways and kept out by an air pressure along the entire construction. This method achieves the best results. A blower is at work in the cellar of the Marlborough Hotel; and another in the basement of 18 Cortlandt street; and the subways where these machines reach are free from gas, generally speaking.

The Board of Electrical Control can, by compelling the use of blowers or air compressors and the forcing of fresh air through the subways, wherever subways are constructed, effectively obviate the danger of explosions, except in cases of free leaks of gas in large quantities, and will undoubtedly do so. But, while this action on the part of the Board of Electrical Control will reduce the chances of explosions in the electrical subways, it will increase the danger in house vaults, sewers and other places in which the gas may be driven.

THE WRONG AND THE REMEDY.

This, therefore, is not the philosophic solution of the questions which present themselves in connection with an investigation such as the Board has lately conducted. These questions may be set out as follows:

First. Is it in conformity with the proper exercise of their franchise by the gas companies that they should allow the commodity in which they deal to become a nuisance to other corporations having rights in the streets underground and to endanger the safety of the community?

Second. Is it possible to provide against the escape of gas into the streets underground, so that there will be no necessity for using expensive means of ventilating subways, and so that there will be no danger of explosions taking place either in the subways, the house vaults or the sewers?

Third. Who is responsible for explosions and their results?

Fourth. What is the remedy for the existing evil?

A careful consideration of these questions makes it apparent that the only rights conferred upon the gas companies, the steam companies, or any company which has a franchise in the streets underground, is the right to conduct each its several commodity along the streets beneath the surface thereof without interfering with the rights of other companies or of citizens. The old maxim, "So use your own as not to injure another," applies with great force in the case of the creature of law exercising a franchise along the public highway and conducting a quasi-public business.

Again, there is no doubt but that the escaping of gas into the streets of the city is due to carelessness in the construction of the gas mains, the use of improper material and the lack of proper care and repairs. It is not at all necessary that, because companies are allowed to conduct gas under the streets, they should also, as the President of one of the companies declared, "have the right to leak."

The very volatile natural gas used in Pittsburg, under a pressure thirty times as great as that under which the illuminating gas in this city is carried, is kept within bounds; and, if this can be done in Pittsburg, it certainly can be done in New York; and it is only because the natural gas is, in a degree, more dangerous that extra precaution is taken with regard to it. And now that it has become apparent that the ordinary illuminating gas, if allowed to escape, is also dangerous, it must be conceded that it should be confined to the mains and pipes of the gas companies, and not allowed to percolate through the soil into subways, sewers and house vaults.

The responsibility for explosions in the streets, whether in subways, sewers or house vaults, therefore, rests upon the companies allowing the illuminating gas to escape, and not upon those into whose premises it comes unbidden, to their damage, and the danger of the community.

Let it be conceded for an instant that this responsibility for what escapes from the gas pipes is not upon the gas companies, and the natural deduction must be allowed that should electrical companies allow their electricity to escape they would not be responsible for what it did in the way of damage; or should the Steam Heating Company allow its steam to escape from its pipes it would not be responsible for whatever damage might be done by the escaping steam; and so on, until one would be obliged to conclude that the owner of wild beasts allowed to run at large upon the public highway would not be responsible for their depredations, and a state of things would result which would render a popular community like the City of New York more unsafe than the most remote and uncivilized portion of the globe.

In the course of the investigation by the Board of Electrical Control it was stated by the President of one of the gas companies that explosions were a natural and inevit-

able incident of city life. It is presumed that this assertion was made in the spirit of the conservative creed, "Whatever is, is right."

At the time when it was first suggested that the electrical conductors should be placed underground, rather than be operated upon unsightly structures in the streets, to the detriment of the safety and comfort of the citizens of New York, those who possessed the same belief in the fitness of the existing were loud in their protests against the practicability of any other arrangement by which electrical business could be conducted. The electrical companies declared before committees of the Legislature, and in every other place where they could obtain a hearing, first, that it was utterly impossible to operate their wires in any other way than that in use by them, and, second, that they had certain rights which must be respected, and continued to them, notwithstanding the desire of the people that they should exercise their franchise in a way less obstructive of the streets and more convenient to the other uses to which the streets were subject. When they were given an opportunity of devising a plan for placing their electrical conductors underground they found it impossible to do so. The result of their conservatism was that the people of the State of New York declared to them, If you cannot find a way for relieving the streets we will find one for you. And so it has proved. And the wires are going underground, and the poles are falling at the rate of twenty-five hundred per annum.

The same mode of procedure must be pursued with reference to the encroachments of the gas companies and steam companies and others doing business underground. If they are unable to conduct their business in such a manner as to preserve the rights of others, and to subject the streets, the electrical subways, the sewers and the house vaults to the least possible disturbance, they should be shown how to do so and compelled to conform to proper police regulations in the enjoyment of their profitable privileges.

There is to-day in the City of New York no public authority vested with power to reform the abuses which exist in our streets underground. The Commissioner in charge of streets has to do only with replacing of the pavements when they are disturbed, and cannot even refuse permission to a gas company to tear up the streets, or make any conditions as to how its mains shall be laid, or its pipes tested or ventilated, provided the pavement is replaced to his satisfaction.

The Health Department, which is perhaps the most powerful police regulator in the City of New York, can do nothing except in cases of very apparent carelessness, and even then cannot designate the way in which repairs shall be made or to what tests the gas and steam mains and other underground constructions shall be submitted.

Your Committee, therefore, respectfully recommends:

First. That the Consolidated Telegraph and Electrical Subway Company, in charge of the subways, be directed, under the supervision of the Engineer of the Board of Electrical Control, to make such further provision for blowers and air compressors as may insure such safety as can be had from explosions in the subways.

Second. That the attention of the local authorities be called to the condition of affairs in the streets underground in the City of New York, and that the Corporation Counsel be requested to draft such a measure as will devolve upon some competent municipal Board the same control over the streets underground and all underground construction as is at present exercised by the Board of Electrical Control in the case of

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the subways for electrical conductors, and that all the local authorities be invited to join with the Board of Electrical Control in petitioning the Legislature and the Executive of the State of New York for the passage of such an act.

All of which is respectfully submitted.

(Signed) THOS. F. GILROY, Com'r Pub. Works,
DANIEL L. GIBBENS, Com'r El. Control.

(Copy)

DEPARTMENT OF PUBLIC WORKS,
OFFICE OF ENGINEER IN CHARGE OF SEWERS,
31 CHAMBERS ST., ROOM 9,

NEW YORK, July 25th, 1889.

HON. THOMAS F. GILROY, Commissioner of Public Works:

DEAR SIR:—We have read the report of the Committee of the Board of Electrical Control upon the subject of the numerous explosions which have taken place in the subways, in which the cause is attributed to leakage from the gas mains, and which concludes by suggesting legislation upon the matter, and beg leave to report thereon that, in our opinion, the leakage comes mostly from defective taps for house connections, and would propose that the Gas Commission be empowered, first, to determine, by proper tests, whether the mains are gas tight when originally laid, and, second, what kind of taps should be used, and what mechanical devices should be employed in applying them to the gas pipes.

Yours resp'y,

(Signed) HORACE LOOMIS, Engineer in Charge of Sewers,
(Signed) G. W. BIRDSALL, Chief Engineer Croton Aqt.

(Copy)

NEW YORK, July 16th, 1889.

E. H. JANES, M. D., Ass't Sanitary Superintendent:

SIR:—I have the honor to report the following facts in relation to the electrical subways in this City:

There are now about 1,100 miles of gas mains in this City. The leaky joints and imperfections in these mains allow nearly 10 per cent. of the gas made to escape into the earth and air. About 8,660 million cubic feet of gas were made during the past year, 10 per cent. of which would be 866 million cubic feet. A large amount of this leakage finds its way into the subways. I have repeatedly noticed this fact, from the strong odors of gas which comes from the crevices in the covers of the subway manholes, and when the covers are removed. On July 11th, about 11.30 P. M., I found a strong odor of gas coming from manhole of the subway on the corner of 38th street and Madison avenue. The odor was perceptible at least 200 feet away.

Many of the complaints of gaseous odors in this City are, in my opinion, due to the gas escaping from the electrical subways. The danger of explosion, should the gas accumulated in the subways be ignited, is great.

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I would, therefore, respectfully recommend that electrical subways in this City be properly ventilated, so as to prevent the dangerous accumulation therein of illuminating and other gases.

Respectfully submitted,

(Signed)

EDWARD W. MARTIN, Chemist.

JULY 16TH, 1889.

Respectfully forwarded to the Office of the Board with the recommendation that it be referred to the Subway Commission.

(Signed)

E. H. JANES, M. D., Ass't San. Supt.

A true copy.

(Signed)

C. GOLDMAN, Chief Clerk.

(Copy)

HEALTH DEPARTMENT,

No. 301 MOTT ST.,

NEW YORK, July 18, 1889.

TO THEODORE MOSS, ESQ., Secretary, the Board of Electrical Control:

SIR:—At a meeting of the Board of Health of the Health Department of the City of New York, held on July 16, 1889, a resolution, of which the following is a copy, was adopted:

Resolved, That the Report of Chemist Martin, with recommendation of Assistant Sanitary Superintendent Janes, on necessity of properly ventilating the electrical subways of this City, be forwarded to the Board of Electrical Control, with the request, that for sanitary reasons, proper action be taken.

A true copy.

C. GOLDMAN, Chief Clerk.

Classified Statistics of Deaths from Accidental Causes occurring in the City of New York during the Year ending December 31st, 1888, made up from Information contained a communication from the Health Department to the Secretary of the Board of Electrical Control, dated July 2d, 1889:

Fractures and Contusions.....	154
including,	
While tobogganing.....	1
By falling walls and buildings.....	4
By being trampled on at fire.....	1
By machinery.....	7
By fall of heavy bodies.....	46
On railways.....	13
By collision on El. R. R.....	1
By kick of horse.....	6
Wave on S. S. Umbria.....	1
By horse-cars.....	8
By explosions of powder.....	2
By runaway wagons.....	2

Drowning	173
Neglect and exposure.....	9
Falls	391
including,	
While wrestling.....	1
Through hatchways and elevator shafts.....	31
Through broken rail of balcony.....	1
From Tally-Ho Coach.....	1
From carts and wagons.....	8
Knocked down by running child.....	1
Into hold of vessel.....	2
On roller skate.....	1
Down aqueduct shaft.....	1
Burns and scalds.....	122
including,	
By careless use of kerosene.....	17
By explosions.....	11
By smoking in bed.....	1
At fire.....	13
Suffocation	85
including,	
Overlaid	21
At fires.....	30
By food.....	4
By foul air in bunk of vessel.....	1
By illuminating gas.....	14
Sat upon by father.....	1
By caving in of subway work.....	2
Poison	173
including,	
By lead.....	1
By opium.....	12
By mercury.....	1
By chloral.....	1
By ether during surgical operation.....	1
By illuminating gas.....	18
By carbolic acid.....	6
By chlorate of potash.....	3
By arsenic.....	3
Killed by vehicles in street, exclusive of horse-cars.....	55
Run over on railways, including 14 by horse-cars.....	64
Killed by electric light wires.....	5
Killed by explosions of cartridges.....	3
Killed by self-produced abortion.....	3
Wounds	21
including,	
By kick of horse.....	2
By swallowing glass from broken bottle.....	1
Total Deaths.....	1,258

Commissioner Gibbens offered the following resolutions:

Resolved, That the Report of the Committee upon the investigation made of the explosions in the electrical subways at the corner of 23d street and Fifth avenue be spread upon the minutes, that it be printed in the form of proof sheets and copies be sent to each of the members of Departments in the City of New York, with request for such information and suggestion as they may see fit to make, that it be brought up with those suggestions at a future meeting of the Board, and that at the proper time and meeting of the Legislature it be incorporated in a resolution to be sent to the Legislature.

Unanimously adopted.

Resolved, That the Secretary be directed to notify the Civil Service Commission at Albany of the appointment of John B. Trainer as Assistant Secretary of this Board in place of Frederick A. Lovecraft, resigned, to take effect from the date of this meeting.

Unanimously adopted.

Commissioner Gibbens: At a recent meeting of the Board a resolution, which I offered for the promotion of two of our employees to the position of clerks, was laid on the table in order that the consensus of opinion from different electrical companies as to the necessity of this employment might be had. We have received a number of letters, and all of the letters are in favor of this additional employment, showing that the companies are willing to bear the extra expense in order that they may have increased facilities.

The Commissioner thereupon moved the following resolution:

Resolved, It being necessary to the proper conduct of the business of the Board of Electrical Control and the duties devolved upon it by law, there shall be in the Office of the said Board, from and after the first day of July, 1889, a Clerk of Record of Electrical Conductors, whose compensation shall be at the rate of twelve hundred dollars per annum during such time as his services shall be necessary. It shall be the duty of the said Clerk of Record of Electrical Conductors, under the direction of the Secretary of the Board, to keep a book or books, containing a complete record of the reports of the inspectors of Electrical Conductors of the Board and of all notices sent to companies operating electrical conductors with reference to the condition of the same and of all reports made from whatsoever source of the tests of electrical conductors overhead or in subways, and to furnish, from time to time, such statements as may be required regarding the condition of the electrical conductors, the number of poles and overhead wires removed in accordance with the provisions of law, the location of dangerous poles, electrical conductors and fixtures and the proceedings taken with reference to the electrical conductors upon the report of every inspection of the same. The Secretary is directed to request the State Civil Service Board to examine such of

the Inspectors of the Board of Electrical Control as may appear for promotion to said clerkship.

There shall also be in the Office of the Board of Electrical Control a Permit Clerk, who shall receive compensation at the rate of twelve hundred dollars per annum during such time as his services may be required. It shall be the duty of said Permit Clerk, under the direction of the Secretary of the Board, to tabulate and record all applications for permits to place electrical conductors overhead or in the subways, to keep a book containing a copy of every such permit granted by the Board, and to file with the Mayor of the City and with the Police Department a copy of every such permit, and to see to it that every such permit specifies the location of the structures to be erected and to be used for sustaining the electrical conductors, gives the general dimensions thereof, and designates the route and location thereof, and prescribes and regulates the height at which such wires or cables shall be placed, and that such permit is subject to the Rules and Regulations prescribed by the Board and by the local authorities in charge of streets, avenues, highways and public places of the city, and to make such statements, from time to time, as may be required regarding the number of permits applied for, granted, acted upon or revoked. The Secretary is directed to request the State Civil Service Board to examine such of the employees of the Board as may apply for promotion to said clerkship.

Unanimously adopted.

Commissioner Gibbens offered the following preamble and resolutions:

Whereas, in the opinion of the Board, a sufficient construction of electric subways underground has been made ready, reference being had to the general direction and vicinity of the electrical conductors in use overhead in the following streets and localities of the city, to wit:

For Electric Light and Power Conductors:

Sixth avenue, from 19th street to 14th street,
14th street, from Sixth avenue to First avenue,
22d street, from Broadway to Fourth avenue,
26th street, from Broadway to Fifth avenue,
26th street, from Broadway to Sixth avenue,
42d street, from Broadway to Fifth avenue, and
125th street, from Eighth avenue to Third avenue;

For Telephone and Telegraph Conductors:

79th street, from Fourth avenue to First avenue,
Lexington avenue, from 79th street to 65th street,
Madison avenue, from 58th street to 59th street,
58th street, from Eighth avenue to Tenth avenue,
Tenth avenue, from 58th street to 59th street,
Houston street, from Chrystie street to Allen street,

Centre street, from Worth street to Grand street,
Murray street, from Broadway to College Place,
Barclay street, from College Place to West street,
Dey street, from Church street to Greenwich street, and from Broadway to Church
street,

Broad street, from Exchange Alley to Wall street,
Nassau street, from Wall street to Pine street, and
45th street, from Vanderbilt avenue to Eighth avenue;

Resolved, That the Secretary transmit the usual notice to the companies interested
directing the removal of all poles and wires, as enumerated, within ninety days; and

Resolved, That the Metropolitan Telephone and Telegraph Company be directed
to remove its poles and wires from 19th street because a subway has been built in 18th
street sufficient for the purposes of its 19th street line; and

Resolved, That the Western Union Telegraph Company be notified to remove its
poles and wires from 46th street in such part as is parallel with the 45th street sub-
way, which is sufficient for the operations of this line.

Unanimously adopted.

Engineer Kearny submitted the following Report:

NEW YORK, Aug. 15, 1889.

To the Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN :—Your Engineer has to report that since the last meeting of the Board
the Construction Company, performing the work ordered by your Board, has com-
pleted subways for electric light in 14th street, from First avenue to Sixth avenue, and
along Sixth avenue, from 14th street to 18th street, where it joined the subway pre-
viously constructed for similar service.

And for telephone and telegraph service, along 79th street, from First avenue to
Fourth avenue, and in Lexington avenue, from 79th street to 65th street, where
it joins the subway previously constructed for similar service.

All of the work ordered for construction at the last meeting of the Board has been
started, excepting that portion on Third avenue and Bowery, which, I am advised, has
been ordered for Monday morning. The construction of above work has proceeded
very slowly, owing to various causes, among them I have to mention lack of material
and very bad weather for out-of-door work.

I have to recommend for construction this season subways in the following streets:

For Electric Light Service:

A crossing of Broadway at 52d street,
A crossing of Sixth avenue at 53d street;

For Telephone and Telegraph Service:

An extension of the 79th street Subway from
Fourth avenue to Fifth avenue and from

First avenue to Avenue A ;
Also in Cedar street, from Church to West streets, and across West street to Pier No. 13, North River ;
Also in Wall street, from west side of Nassau street to east side of Pearl street.

The material for all the above to consist of iron tube laid in hydraulic cement, and the number of tubes to be determined by the Engineer.

Very respectfully,

H. S. KEARNY, Engineer.

Mayor Grant offered the following resolution :

Resolved, That the Secretary be directed to notify the Consolidated Telegraph and Electrical Subway Company that, unless work is begun within five days on all the subways heretofore ordered to be constructed and proceeded with diligently, so that the promise made by the Company that they will be completed by the first day of December can be kept, this Board will take such action as is provided by Chapter 716 of the Laws of 1887 to carry out the provisions of that Act.

Unanimously adopted.

Commissioner Gibbens : I move that the Engineer's Report be spread upon the minutes, and his recommendation as to additional subways be approved and they be ordered subject to the plans which the Engineer has on file in his office.

Mayor Grant : Let us take that up at the next meeting.

Commissioner Gibbens : And, also, Mr. Chairman, I would like that the Engineer be directed to bring in a plan for a subway from the station of the United States Electric Light Company to the New York Post Office, in order that the Post Office building may be lighted by electricity underground.

Mayor Grant : I see no objection to that ; but I am frank to say that I am not in favor of ordering more subways while the Construction Company is not commencing work on others already ordered.

Commissioner Hess : These are local.

Commissioner Gibbens : If the Construction Company don't start the work in five days the Board will take measures to have these subways built in accordance with laws.

Mayor Grant : If they are not finished on December 4th, I propose to make such a motion as I deem wise in the premises.

Commissioner Gibbens : I have here a communication from the Treasury Department at Washington relative to the lighting of the New York City Post Office by electric light. The Post Office Department has made a contract with the United States Illuminating Company, which has no wires to the Post Office, and it is a question whether the Board of Electrical Control will assist the New York Post Office by giving the United States Company the right to string four wires from No. 176 Washington

street along Washington street to Fulton street, along Fulton street, from Washington street to Broadway, along Broadway, from Fulton street to Park Place, and across Broadway at the head of Park Place to the Post Office Building. I move that the Secretary be directed to advise the Assistant Secretary of the Treasury, Mr. Batcheller, that within a short time we expect to have a subway for electric light all the way down Broadway and to the Post Office, through which these wires go, and until then the Post Office had better avail itself of the plant which it has in the building.

Mayor Grant: Is there any extreme hurry?

Mr. Browne (of the U. S. Co.): The Treasury Department has requested us to remove that plant, in order that it may have the use of the room occupied by that plant and to avoid the additional heat and annoyance caused by it. All that we ask for on Broadway is the privilege of crossing Broadway at that point.

Mayor Grant offered the following resolution:

Resolved, That the application of the United States Illuminating Company, dated August 12, 1889, to string four wires along a route therein designated from its station at No. 176 Washington street to the New York Post Office Building, be laid over until the next meeting.

Unanimously adopted.

The following communication from the United States Illuminating Company was read:

NEW YORK, August 15, 1889.

HON. HUGH J. GRANT, Mayor and Chairman of the Board of Electrical Control, New York City:

DEAR SIR:—Some time ago we received a letter from the Expert of the Board of Electrical Control, advising us to take steps toward improving the insulation and general condition of our overhead circuits in this city. As we stated in a former reply to that letter, we are not only willing, but glad to do this, and have ordered a large amount of newly insulated wire for this purpose. It is difficult for us to determine in advance just where repairs on our circuits are needed, and we will be greatly facilitated in our work if your Honorable Board will accord us general permission to repair our lines wherever repairs seem to be needed, and to take down such of our lines as are not properly insulated and replace them with wire properly insulated. We are advised that, under the rules of the Board, we already have such authority; but, to remove all doubt, we would prefer that a formal permit on the line suggested be granted to us.

We would also request a general permit to replace split, rotten and defective poles with new ones when we are ordered to do so by the Board of Public Works.

It is, of course, assumed that in case this permit be granted, all poles erected under it shall be under the Board of Electrical Control.

Very respectfully yours,

C. H. JACKSON, President.

Mayor Grant offered the following resolution:

Resolved, That in the matter of repairs to the lines of the United States Illuminating Company such as indicated in its communication, dated August 15, 1889, read at this meeting, the Company, wherever it desires to replace a pole, obtain the approval of the Engineer, and wherever it desires to repair or replace a wire, obtain the approval of the Expert.

Unanimously adopted.

The following communication from the United States Illuminating Company was read:

NEW YORK, August 15, 1889.

HON. HUGH J. GRANT, Mayor, etc., and President of the Board of Electrical Control:

DEAR SIR:—We have a number of cables already laid in subways which have been built, and are ready to lay additional cables in the subways already built and those in process of construction, for the purpose of supplying numerous contracts which we have along the line of said subways. We are at present unable to use these cables and supply many of our customers along the line of the subways, for the reason that, owing to the fact that the subways on 23d and 29th streets have not been completed and probably will not be ready for use for a considerable time, we cannot connect our stations with the cables in the subways. This state of affairs prompts us to make the following application to the Board:

To place upon existing poles such overhead wires as shall be necessary to connect our stations with cables in the subways. The wires so strung to be removed as soon as we can have cables laid in the subways now being constructed to reach our stations.

You will notice that the permit for which we ask is only temporary, and is made for the very purpose of enabling us to avail ourselves of the subways.

We respectfully request that this application receive the immediate attention of your Honorable Board, as it is one which is vital to the success of our business.

Very respectfully,

THE UNITED STATES ILLUMINATING CO.,

C. H. JACKSON, President.

Mayor Grant offered the following resolution:

Resolved, That the communication of the United States Illuminating Company, dated August 15, 1889, making application to place overhead wires on existing poles to connect its stations with its cables in the subways, be referred to Expert Wheeler to report at the next meeting.

Unanimously adopted.

The following communication from the United States Illuminating Company was read:

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NEW YORK, August 15, 1889.

HON. HUGH J. GRANT, Mayor and Chairman of the Board of Electrical Control, New York City:

DEAR SIR:—We wish to call the attention of your Honorable Board to several matters of minor detail, and we respectfully request that you provide some general plan whereby the immediate necessities of the business of electric lighting can be attended to promptly.

1. We have recently been awarded by the city the contract for lighting from our present circuits 240 city street arc lights which we had not heretofore lighted. This fact makes more important than heretofore the need which we have felt for some time of re-arranging our circuits. This will not involve the stringing of any additional wire, and we respectfully request general authority to re-arrange our circuits, without the use of additional wire, and, of course, subject to the inspection and approval of the proper representative of your Board.

2. We respectfully request that some officer of your Honorable Board, to whom we can have access at any time, be empowered to grant permits, upon applications, for the following purposes:

- a. To alter the position of lamps already in place.
- b. To take down and rehang lamps already in place.
- c. To rehang old lamps which have temporarily been taken down.
- d. To transfer connections from one circuit to another.
- e. To make connections from existing circuits to new customers, and in this to permit the crossings of streets where required, and also short loops to customers on streets adjacent to circuits.

Very respectfully,
THE U. S. ILLUMINATING COMPANY,
C. H. JACKSON, President.

Commissioner Gibbens: I offered a resolution at a previous meeting of the Board that the Board should vest in the Secretary the power to attend to all such applications as this on the recommendation of the Engineer and the Expert; but the resolution was laid over. Now, I think it would be well at the next meeting of the Board to have a resolution brought in to cover these points. If the Chairman will authorize me I will bring in such a resolution covering these points, and then we can discuss it.

Mayor Grant: Then this matter will be referred to you to report at the next meeting of the Board.

Mayor Grant offered the following resolution:

Resolved, That the application of the Electric Power Company, dated June 25th, 1889, to string wires over certain streets therein named from proper housetop fixtures in place of wires now attached to poles in such streets not now provided with underground accommodations for such wires, be referred to Commissioner Gibbens.

Unanimously adopted.

Commissioner Gibbens called for the reading of the Report of the Electrical Expert on Poles and Wires; the same was read, and, on motion of Mayor Grant, ordered to be spread upon the minutes.

The following is the Report:

REPORT OF ELECTRICAL EXPERT.

Details of all Notices of Violations of Rules and Regulations Sent from June 16th to July 15th, 1889, Inclusive.

	No. of V's	No. of N's s't	2nd Notices	Notices Ans'd	Notices Att'd to	Notices Sent to B. of I.
U. S. Co.—Dead Poles						
Low lamps.....	1	1	1			
Useless poles.....	2	1		1	1	1
—	—	—	—	—	—	—
Total	3	2	1	1	1	1
Brush Co.—						
Dead Poles.....	10	1			1	1
W. U. Tel. Co.—						
Dead poles.....	36	10	2	2		
Dang's fix's.....	1	1				
—	—	—	—	—	—	—
Total	37	11	2	2		
Met. Tel. Co.—						
Dead poles.....	2	2	1			
Dang's poles.....	1	1				
—	—	—	—	—	—	—
Total	3	3	1			
Fire Dep't—						
Dead poles.....	2	2			1	1
Dang's poles.....	2	2				
—	—	—	—	—	—	—
Total	4	4			1	1
Owner Unknown—						
Dead poles.....	22				6	8
Dead wire.....	24					21
Useless poles.....	3	1			1	2
Dang's poles.....	1				1	1
—	—	—	—	—	—	—
Total	50	1			8	32
—	—	—	—	—	—	—
Grand Total.....	107	22	3	3	11	35

BUREAU OF INCUMBRANCES.

Wire removed, 2,009,800 ft.—380 miles
Poles removed, 68.

The following communication from the Western Union Telegraph Company was read in connection with the Report of the Electrical Expert:

NEW YORK, August 14, 1889.

S. S. WHEELER, Electrical Expert, Board of Electrical Control, 1266 Broadway, N. Y.:

DEAR SIR:—For your information, I beg to say that poles and wires belonging to this Company have been taken down, as follows:

All poles and wires in 110th St., bet. 4th and 8th Ave.

Wires on the east side of Church street from Barclay to Canal have been removed to poles on the opposite side of the way, and the poles (17 in number) taken down.

Line in 51st St. from the North River to 11th Ave., and

In 11th Ave., from 51st street to 42d street, with the exception of four poles, which have fire and telephone wires thereon.

I may add that the record for the month of July is 211½ miles of wire and 25 poles.

Very respectfully,

W. C. HUMSTONE, Superintendent.

Mayor Grant offered the following resolutions:

Resolved, That, upon its applications therefor on file, permits issue to the United States Illuminating Company to connect with its circuits electric lamps at the following places:

710 Broadway, 49½ First avenue, 235 Broadway, 479 Broadway, 459 Third avenue, 171 Eighth avenue, 680 Broadway, 84 Vesey street, 686 Broadway, 30 Union Square, 35 Cortlandt street, 494 Third avenue, 369 Broadway, 648 Broadway, 97 Walker street, 148 Fulton street, 3 Astor House, 175 Broadway, 55 Broadway, 1 Barclay street, 323 Grand street, 735 Broadway, 727 Broadway, corner of Spring street and Broadway, 548 Broadway, 69 Avenue A, corner of Fourth avenue and 42d street, 203 Washington street, 303 Grand street, 51 Elm street, 1003 Third avenue, 425 Eighth avenue, 302 Broadway, 74 Chambers street, 329 Broadway, 166 Broadway, 3, 5 and 7 Irving Place, 161-163 Bowery, 131-133 Chrystie street, 6 Astor House, 703 Broadway, 36 Catharine street, 1629 Third avenue, 135 Broadway, 189 Broadway, 256 Fulton street, 17 and 19 Park Row, 432 Eighth avenue, 70 Liberty street, 88 Vesey street, 358 Grand street, 93 Avenue B, 76 Cortlandt street, 164 Bowery, 216 Broadway, 165-171 Grand street, 206 Grand street, corner of Beaver and South William streets, 334 Eighth avenue, 49 Cortlandt street, 30 Avenue C, 16 Cooper Institute, 513 Eighth avenue, 290 and 292 Eighth avenue, 279 Broadway, 290 Grand street, 5 Barclay street, 306 Broadway, 157 Broadway, 107 Eighth avenue, 240 Broadway, 54 Avenue B, 261 Fourth avenue, 327 Fourth avenue, 424 Fourth avenue, 460 Fourth avenue, 403 Fourth avenue, 20 Union Square, 2 Union Square, 6 Union Square, 14 Cortlandt street, 24 Cortlandt street, 73 Cortlandt street, 75 Chambers street, 140 Chambers street, 367 Grand street, 259 Greenwich street, 164 Greenwich street, 203 Bowery, 255 Canal street, Park Row and

Centre street, S. E. corner of Chambers and West streets, 484 Grand street, 292 Grand street, 375 Grand street, 378 Grand street, 296 Grand street, 343 Grand street, 518 Grand street, 276 Grand street, 416 Grand street, 302 Grand street, 102 Second avenue, 34 Second avenue, 24 Second avenue, 9 Second avenue, 108 Avenue B, 187 Sixth avenue, 197 Sixth avenue, 199 Sixth avenue, 110 Sixth avenue, 169 Eighth avenue, 198 Eighth avenue, 205 Eighth avenue, 225 Eighth avenue, 226 Eighth avenue, 235 Eighth avenue, 258 Eighth avenue, 271 Eighth avenue, 281 Eighth avenue, 497 Eighth avenue, 516 Eighth avenue, 520 Eighth avenue, 536 Eighth avenue, 585 Eighth avenue, 601 Eighth avenue, 85 Warren street, 73 Park Row, 399 Grand street, 335 Broadway, 397 Grand street, 138 Bowery, 669 Eighth avenue, 275 Broome street, 193 Sixth avenue, 135 Bleeker street, 700 Third avenue, 323 Grand street, 123 Essex street, 976 Third avenue, 645 Broadway, 678 Broadway, 658 Broadway, 647 Broadway, 123 Eighth avenue, 74 E. 4th street, Pier 28, foot of Murray street, Astor House, Broadway, 14 Cortlandt street, 387 Grand street, 27 Second avenue, 101 Avenue A, 328 Grand street, 265 Broadway, 1001 Third avenue, 982 Third avenue, 367 Eighth avenue, 14 Barclay street, 451 Eighth avenue, 50 Bowery, 246 Bowery, 298 Bowery, 310 Bowery, 361 Bowery, 328 Bowery, 291 Bowery, 280 Bowery, 268 Bowery, 262 Bowery, 249 Bowery, 256 Bowery, 254 Bowery, 237 Bowery, corner of Bond street and Bowery, 66 Bowery, 76 Bowery, 99 Bowery, 142 Bowery, 85 Bowery, 36 Essex street, 41 Essex street, corner of Broome and Essex streets, corner of Division and Essex streets, 34 Bond street, corner of Eldridge and Rivington streets, 917 Eighth avenue, 34th street and Eighth avenue, 127 E. 23d street, 139 Bleeker street, 23 Dey street, 50 Vesey street, 33 Broadway, 58 Broadway, 37 Broadway, 55 Broadway, 63 Broadway, 38 Broadway, 71 Broadway, 145 Broadway, 152 Broadway, 158 Broadway, 163 Broadway, 159 Broadway, 228 Houston street, 280 Canal street, 300 Canal street, 322 Canal street, 306 Canal street, corner Mercer and Canal streets, corner of Broadway and Canal street, 397 Canal street, 693 Broadway, 99 Spring street, 143 Sixth avenue, 173 Bleeker street, 405 West street, 298 West street, 256 Grand street, 108 Bowery, corner of Chrystie and Hester streets, 5 Broadway, 142 Park Row, 621 Broadway, 902 Third avenue, 37 Lispenard street, 6 West 3d street, corner West Broadway and North Moore street, 43 Third avenue, 434 Broadway, 701 Broadway, 14 Park Row, 293 Houston street, 646 Eighth avenue, 173 Broadway, 412 Broadway, 381 Grand street, 101 Chambers street, 277 Broadway, 850 Eighth avenue, 12 Catharine street, 733 Broadway, 207 Bowery, 302 Grand street, 123 Essex street, 56 Avenue A, 127 Third avenue, 14 Stanton street, 137 Broadway, 492 Eighth avenue, 835 Eighth avenue, corner of Fourth avenue and 24th street, 250 Grand street, 91 Park Row, 510 Broadway, 27 Bowery, 140 W. 23d street, 324 Grand street, 633 Eighth avenue, 16 Avenue A, 426 Grand street, 283 Canal street, 956 Third avenue, 226 Grand street, 44 Greenwich street, 271 Broadway, 282 E. Houston street, 322 Fourth avenue, 717 Eighth avenue, 391 Eighth avenue, 525 Eighth avenue, 457 Eighth avenue, 9 Warren street, 257 Broadway, 136 W. 23d street, 640 Eighth avenue, 957 Third avenue, 281 Bowery, 641 Broadway, 284 E. Houston street, 263 Eighth avenue, 96 Sixth avenue, 545 Broadway, 242 Canal street, 56 Avenue B, 116 Rivington street, 283 Canal street,

237 Fulton street, 95 Essex street, 323 Fourth avenue, 406 Grand street, 412 Grand street, 935 Third avenue, 190 Third avenue, 42 Avenue B, 51 Cortlandt street, 956 Third avenue, 957 Third avenue, 78 Essex street, 158 Bowery, 80 Park Row, 131 E. 8th street, 460 Grand street, 125 Grand street, 82 Duane street, corner 2d street and Second avenue, 410 Broadway, 549-553 Broadway, 83 Duane street, 3 and 5 Bond street, 198 Bowery, 1342 Third avenue, 159 E. 58th street, 369 Broadway, 374 and 376 Broadway, 466 and 468 Broadway, 473 Broadway, Fourth avenue and 8th street, 189 Bowery, 131 Bowery, 62 Lispenard street, 388 Broadway, 403 Broadway, 483 and 485 Broadway, 325 Broadway, 377 and 379 Broadway, 263 Bowery, 359 Bowery, 222 Bowery, 133 Bowery, 235 and 237 Bowery, 195 Bowery, 182 Bowery, 176 Bowery, 675 Broadway, 731 Broadway, corner of Grand and Forsyth streets, 264 Grand street, 270 Grand street, N. W. corner Canal street and Bowery, 478 Broadway, 488 Broadway, 555 Broadway, Pier 15, foot of Liberty street, 242 Grand street, 244 Grand street, 254 Grand street, 256 Grand street, 116 Bowery, 73 Bowery, 480 Broadway, 554 Broadway, 605 and 609 Broadway, 64 Bowery, corner Grand and Elm streets, corner of Grand and Eldridge streets, 301 Grand street, 179 Bowery, 269 Bowery, 164 Park Row, 25 Park Place, 157 Eighth avenue, 161 Sixth avenue, 47 Barclay street, 7 Bond street, 25 Bond street, 125 and 127 Park Row, 4 and 6 New Chambers street, 61 Bowery, 162 Park Row, 156 Park Row, 93 Park Row, corner of Duane street and Park Row, 182 Park Row, 92 Bowery, 78 Bowery, 14 Bowery, 16 Bowery, Park Row at the Bridge, 720 Broadway, 697 Broadway, corner of Bowery and Spring streets, 393 Broadway, 616 Broadway, 547 Broadway, 564 Broadway, 519 Broadway, 455 Broadway, 285 Broadway, 390 Broadway, 325 Bowery, 348 Bowery, 266 Bowery, 366 Bowery, 350 Bowery, 230 Bowery, 136 Bowery, 273 Bowery, 74 Bowery, 107 Bowery, 92 Bowery, 136 Park Row, Nos. 47, 83, 85, 87, 100, 104, 106, 114, 116, 127, 140, 142, 146, 159, 157, 166, 175, 177, 183, 186 Sixth avenue, corner of West Broadway and Chambers street, 148 Chambers street, Nos. 629, 665, 675, 710, 715, 724, 731, 733, 767, 781, 787, 851, 865, 875 and 907 Eighth avenue, Nos. 321, 368, 485, 372, 360, 313, 294, 358, 679, 745, 701, 724, 697 and 731 Broadway, 124 Sixth avenue, 252 Broadway, 48 Warren street, 594 Third avenue, 1452 Third avenue, 726 Broadway, 121 Second avenue, 207 Fulton street, 126 E. Houston street, 257 E. Houston street, 375 South street, 635 Broadway, 681 Broadway, 150 Fulton street, 138 Bowery, 347 Broadway, 200 Broadway, 529 Broadway, 158 Broadway, 152 Bowery, 347 Broadway and 136 E. 42d street.

Unanimously adopted.

Resolved, That, upon its applications therefor on file, the United States Illuminating Company be granted permits to do the following acts:

To change connections for lamps from one circuit to another circuit on same pole line, in front of same premises now supplied by present connections:

701 Broadway, 442 Broadway, 34 Broadway, 335 Broadway, 285 Broadway, 325 Broadway, 327 Broadway, 307 Broadway, 121 Nassau street, 799 Broadway, 401 Eighth avenue, 341 Broadway, 323 Broadway, 42 Warren street, 231 Broadway, 233 Broadway, 314 Broadway;

- To rehang four arc lamps at the Academy of Music;
- To rehang arc lamps at 1398 and 1432 Third avenue;
- To hang lamps in existing loops at 77 Avenue A;
- To change the connections for arc lamps at 1356 Third avenue, 4th street and Bowery, Chambers street and Church street, Warren and Church streets;
- To change the City lamp at the foot of Liberty street and West from the pole to outriggers on Central R. R. of New Jersey building, the pole to be removed.

Unanimously adopted.

Commissioner Gibbens offered the following resolutions:

Resolved, That such of the applications of the United States Illuminating Company as are not reported on by Expert Wheeler, coming in too late for inspection, be laid over until the next meeting.

Unanimously adopted.

Resolved, That all applications of the United States Illuminating Company before the Board at this meeting, not otherwise disposed of, be laid over.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated July 19, 1889, to erect a wood lamp post at Harry Howard Square in place of iron one, it being broken down as alleged in application, be referred to Engineer Kearny, with directions to inspect, and grant it if required.

Unanimously adopted.

Mayor Grant offered the following resolutions:

Resolved, That, upon its applications therefor, permits issue to the Brush Electric Illuminating Company to connect with its circuits electric lamps at the following places:

312 Grand street, 369 Eighth avenue, 35 and 37 Avenue D, 250 Grand street, 388 and 390 Bowery, 545 Broadway, 54 Bowery, 547 Broadway, 452 and 454 Grand street, 292 Eighth avenue, 26 Bowery, 445 and 447 Eighth avenue, 275 Broadway, 479 Eighth avenue, 7 to 11 Greene street, 391 Eighth avenue, 228 Bowery, 430 Broome street, Grand street, Nos. 245, 271, 456, 460, 462, Bowery, Nos. 183, 177, 132, 262, 203, 34, 411 Broadway, 18 Spring street, 512 and 514 Eighth avenue, Broadway, Nos. 252, 643, 369, 368, 451, Bowery, Nos. 183, 342, 86 and 250, 302 Grand street, 345 Grand street, 285 Canal street, 304 Canal street, 114-118 W. 25th street, 259 Eighth avenue, 34 Great Jones street, 141 8th street and 114 East 13th street.

Unanimously adopted.

Resolved, That, upon its application therefor on file, a permit issue to the Mount

Morris Electric Light Company to connect with its circuits electric lamps awarded it by the City, as follows:

3 lamps, 13th avenue from Gansevoort to Bloomfield St.,
13 lamps, Gansevoort Market Square,
12 lamps, West Washington Market,
18 lamps, Greenwich street (already connected),
11 lamps, 125th St. from Lenox avenue to Ninth avenue.

Unanimously adopted.

Resolved, That the application of the Mount Morris Electric Light Company to run one wire from its station at Vandam street through Greenwich street and Ninth avenue to 53d street, to connect with existing circuit, be referred to Commissioner Gibbens.

Unanimously adopted.

Resolved, That, upon its application therefor on file, permits issue to the Manhattan Electric Light Company to connect with its circuits electric lamps at the following places:

231 Grand street, 1501 First avenue, 1485 First avenue, 245 and 247, 398, 356, 352, 262 and 284 Eighth avenue, 2243, 2361, 2312 Third avenue, 275 Canal street, S. E. cor. 125th street and Fourth avenue, 138 and 140 Canal street, corner of Bowery, 88 Leonard street, 223 Eighth avenue, 183 Sixth avenue and 47 E. 10th street.

Unanimously adopted.

Resolved, That, upon its application therefor on file, permits issue to the Harlem Lighting Company to connect with its circuits electric lamps at the following places:

1495 Third avenue, 169 E. 126th street, 211 E. 124th street, 2296 Third avenue, 1815 Third avenue, 1655 First avenue, 1485 First avenue, 1434 Third avenue, 2098 Third avenue, 1549 First avenue, 2240 First avenue, 2294 First avenue, 2285, 2064, 2088 and 2052 Third avenue, 44 W. 125th street, 156 E. 125th street, 2400 Third avenue, 1721 First avenue, 2346 Third avenue, 2202 Third avenue, 1513 Avenue A, 2197 Third avenue, 1567 Third avenue, 1674 First avenue and 2100 Third avenue.

Unanimously adopted.

Resolved, That the applications of the Harlem Lighting Company coming in too late for inspection be laid over.

Unanimously adopted.

Resolved, That, upon its applications therefor on file, permits issue to the East River Electric Light Company to connect with its circuits electric lamps at the following places:

668 Third avenue, 164 Bowery, 30 Avenue C, 44th street east of First avenue, 326 Third avenue, 260 Third avenue, 86 First avenue, 888 Third avenue, 325 Grand street, 108 Bowery, 136 Third avenue, 322 Fourth avenue, 56 Avenue B, 16 Cooper Institute, 92 Third avenue, 388 Third avenue, 386 Eighth avenue, 424 Third avenue, 343 Grand street, 982 Third avenue, 364 Third avenue, 16 Avenue A, 54 Avenue B, 784 Third Avenue, 310 Third avenue, 110 Third avenue, 336 Third avenue, 66 Avenue B, 466 Third Avenue, 180 Bowery, 289 Third avenue, 1003 Third avenue, 207 Bowery, 56 University Place, 645 Third avenue, 331 Bowery, 283 Bowery, 33 Third avenue, 422 Second avenue, 311 Eighth avenue, 127 Third avenue, 69 Avenue A, 93 Avenue B, 15 Bowery, 35 Avenue D, 278 Grand street, 631 Third avenue, 991 Third avenue, 27 Avenue A, 325 Third avenue, 91 Park Row, 27 Bowery, 83 Third avenue, 439 Third avenue, 39 Avenue D, 113 First avenue, 37 Avenue D, 143 E. 13th street, 33 Avenue A, 499 Third avenue, 424 Eighth avenue, 162 E. 34th street, 342 First avenue, 291 Avenue A, 208 Grand street, 477 Third avenue, 390 Third avenue, 248 Bowery, 301 Eighth avenue, 151 Eighth avenue, 335 Eighth avenue and 386 Third avenue, 383, 381, 197, 301, 137, 1435 Third avenue, 247 Bowery, 360 First avenue, 311 First avenue, 402 E. 45th street, 141 Sixth avenue, 77 Avenue A, 1357 Third avenue, 146 Bowery, 334 Third avenue, 1324 Third avenue, 152 Bowery, 1034 Third avenue, 24 Bowery, 438 Third avenue, 170 Third avenue, 262 Bowery, 104 Bowery, Third avenue, numbers 706, 324, 1432, 1482, 512, 886, 65 Bowery, 146 Third avenue, 315 Bowery, 570 First avenue, 858 Third avenue, 188 Bowery, 368 Bowery, 915 Third avenue, 935 Third avenue, 1 Fourth avenue, 21 E. 12th street, 45 Avenue A, 129 E. 12th street, 89 Avenue A, 105 Avenue B, 183 First avenue, Third avenue, numbers 137, 235, and 281 First avenue.

Unanimously adopted.

Resolved, That the five applications of the East River Electric Light Company, dated, three of them July 12th, 1889, the others respectively July 22d and 24th, 1889, to string wires over routes therein indicated, etc., be referred to Commissioner Gibbens.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary issue a permit to the Metropolitan Telephone and Telegraph Company to run a wire to connect with the Dump at 38th street and East River, for the accommodation of the Street Cleaning Department.

Unanimously adopted.

Mayor Grant offered the following resolutions:

Resolved, That the application of the Commercial Telegram Company, dated June 11th, 1889, to string a loop (4) wires from roof of the White Elephant to roof

of 41 West 31st street, to connect that building with its Stock Quotation service, be referred to Commissioner Gibbens.

Unanimously adopted.

Resolved, That the application of Robinson & Wallace, for the removal of the Brush Electric Illuminating Company pole standing at the southwest corner of Madison avenue and 34th street to the westerly line of the premises on which it stands, be referred to Engineer Kearny, and that upon his approval of the application a permit issue to the Brush Company for the removal of the pole as suggested.

Unanimously adopted.

The following application was read:

NEW YORK, Aug. 14th, 1889.

Permission is hereby requested by the Mott Haven Messenger and Burglar Alarm Company to construct and maintain a line of wires in the 23d Ward of New York City, along and across the streets and avenues of said Ward, for the purpose of a District Messenger, Burglar Alarm, Night Watch and general electrical service. From the nature of the business proposed, it is impossible to specify in detail herein the particular streets and avenues along and across which it will be necessary to construct said line, but much of the construction will be upon and across private property.

The undersigned are practical electricians, with long experience in the business contemplated, and purpose to establish and conduct the same throughout the 23d Ward in a thoroughly first-class manner.

Subject to the Rules and Regulations of the Board of Electrical Control which are hereby agreed to by

THE MOTT HAVEN MESSENGER AND BURGLAR ALARM CO.

ROBERT MORTON,

C. A. PALMER,

OTIS COLE.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to write a letter to the gentlemen applying as the Mott Haven Messenger and Burglar Alarm Company for permission to construct and maintain a line of wires in the 23d Ward of New York City and inform them that they should first organize as a company and get a franchise before making application for permission to string wires.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That the application of the United States Illuminating Company, dated

June 26, 1889, to run two wires for experimental purposes for the Patten Multiplex Telegraph from 208 Fulton street to Church street, and on Church street from Fulton to Barclay—not requiring any new poles or fixtures—also to run two new wires on existing poles on Barclay street from Church street to No. 47 Barclay street, be referred to Commissioner Gibbens.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Saturday, August 17th, 1889, at 10½ o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Daniel L. Gibbens and Theodore Moss.

On motion of Mayor Grant, the reading of the minutes of the last meeting was dispensed with.

Mayor Grant: The first thing in order will be the reports of Commissioner Gibbens and Mr. Wheeler.

Commissioner Gibbens: In regard to the matters that have been referred to me as a committee to report upon, I have the honor to report the following proposed resolutions, which, if passed, will dispose of all the applications on the table:

Resolved, That the Rules and Regulations of the Board of Electrical Control relative to the stringing of wires, etc., for electric lighting, be modified, as follows:

XXXVIII. The Secretary is authorized to issue permits to properly authorized corporations making application therefor in streets and avenues where no subways have been made ready or in streets and avenues where subways have been prepared in connection with such subways,

- (a). To alter the position of lamps already in place.
- (b). To take down and rehang lamps already in place.
- (c). To rehang old lamps which have temporarily been taken down.
- (d). To transfer connections from one circuit to another.
- (e). To make connections from existing circuits to new customers in the nature of a lamp or motor connection.

Provided, in the case of each application it is endorsed and approved as coming within this rule by the Electrical Expert.

Resolved, That the Rules and Regulations for Overhead Conductors for Electric Light and Power be amended so as to read as follows:

XXXIX. The Secretary is authorized to issue to duly authorized companies making application therefor permits to erect new of the same size poles in place of old poles, upon the endorsement of the Engineer of the Board to the effect that he has inspected such poles and found them to be in a dangerous condition.

Resolved, That the Rules and Regulations for Overhead Conductors for Electric Light and Power be amended as follows:

XL. The Secretary is authorized to issue to duly authorized companies making application therefor, in streets and avenues where no subways have been provided, permission to place additional circuits on existing poles where an inspection and endorsement is made by the Electrical Expert to the effect that such additional circuits are required in either of the following cases:

(a). To enable the company to connect with and make use of an underground conductor already in position.

(b). To enable the company to relieve existing circuits of any improper strain by reason of increase in its business along the line of said circuits.

Resolved, That the Rules and Regulations for Overhead Wires for Signaling be amended so as to read as follows:

XVII. The Secretary is authorized to issue to companies operating electrical conductors of the first class all permits required by them for the making of connections necessary to the business of said companies with lines now in use, in, over and upon streets and avenues where no subways have been provided, not including the erection of any new poles or similar fixtures, and in accordance with the rules and regulations of the Board; provided, however, that no such permit shall be issued by the Secretary except upon the endorsement of the Electrical Expert to the effect that such applications have been examined and are within the provisions of this rule.

Mayor Grant: I do not want to pass rules unless I look them over.

Commissioner Gibbens: Then take up the applications separately.

Mayor Grant: Here is a communication I think we ought to read, and it is what we ought to attend to at this meeting more than anything else; it is from Mr. Eckert.

The following communication from W. H. Eckert, General Manager of the Metropolitan Telephone and Telegraph Company, was read:

NEW YORK, August 17th, 1889.

THE HONORABLE HUGH J. GRANT, Chairman Board of Electrical Control, New York City:

DEAR SIR:—In conformity with your request, I beg to say that the wires used for long distance purposes are carried on the same poles with the wires used for short

distances, both classes of wires, within this city, being the property of this Company. If any statement to the contrary has been made to you, it must have been made under a misapprehension.

Referring to the linemen seen by you working in 73d street, I am unable to ascertain at this time what linemen of this Co. have been recently working in 73d street, but I do say that imperative orders have been given by this Company to all its employees forbidding them to do any work except what has been expressly authorized by the Board of Electrical Control. If it can be found that these orders have been violated, the men will be discharged at once, as it is, and has been, the intention of this Company to act loyally to the Board of Electrical Control, and not countenance any infringement, directly or indirectly, of the Rules of your Board.

Very respectfully,

W. H. ECKERT, Gen'l Manager.

Mayor Grant: Mr. Eckert spoke to me about that, and said that he was acting in good faith personally. As far as I am concerned, I withdraw any opposition as long as that letter goes on file as the statement of this Company, so that we will understand it hereafter. I still believe that I would not have voted for that trunk line had I not supposed it to be for long distance use. However, I don't wish to be captious about it.

The Board thereupon took up the consideration of the applications of the Metropolitan Telephone and Telegraph Company, which had been laid over at the last meeting.

Mayor Grant offered the following resolutions:

Resolved, That applications of the Metropolitan Telephone and Telegraph Company, as follows, be wit:

To run a wire from its underground terminal at corner of Whitehall and Water streets to 18 Front street:

To run a wire from its underground terminal at 93 Front street to 48 South street;

To run a wire from its underground terminal at 18th street and First avenue to 502 E. 17th street;

To run a wire from underground terminal at 13th street and Broadway to 16 E. 15th street;

To run a wire from underground terminal at 42d street and Madison avenue to 510 Fifth avenue;

To run a wire from underground terminal Broadway and 13th street to 79 Fourth avenue;

To run a wire from 18th street and First avenue to foot of 38th street and East River;

To run a wire from underground terminal at 23 Water street to 25 Coenties Slip;

To run a wire from underground terminal, 52 Nassau street, to 51 Cedar street;

To run a wire from underground terminal at corner of Whitehall and Water streets to 31 Moore street;

To run a wire from underground terminal, corner of Whitehall and Water streets to 31 Front street;

To run a wire from underground terminal at Whitehall and Water streets to 39 Whitehall street;

To run a wire from underground terminal at 37-39 Broad street to 13 William street;

To run a wire from underground terminal at New York Stock Exchange to 11 Wall street;

To run a wire from underground terminal at 89 Beaver street to 71 Wall street;

To run a wire from U. T., Front and Pine street, to 96 Wall street;

To run a wire from U. G. Terminal at Water street and Maiden Lane to 88 Wall street;

To run a metallic circuit wire from its Exchange at 33 Murray street to 65 Reade street;

To run a wire from 231 E. 64th street to 188 E. 64th street;

To run a wire from 48 South street to the Brooklyn Bridge Anchorage;

To run a wire from 820 E. 5th street to 814 E. 5th street;

To run a wire from 173 South street to 280 Front street;

To run a wire from 52 New street to 60 Broadway;

To run a wire from 66 Wall street to 54 Wall street;

To run a wire from 49 Wall street to 37 William street;

To run a wire from 36 Beaver street to 44 Wall street;

To run a metallic circuit from U. G. T., 18th street and First avenue, to 208 Avenue A;

To run a wire from U. G. T., 21 College Place, to 36 Park Place;

To run a wire from U. G. T., 32 Broadway, to 24 Beaver street;

To run a wire from U. G. T., 15 and 17 Frankfort street, to 140 Nassau street;

To run a wire from U. G. T., Pine and Front streets, to 120 Front street;

To run a wire from its Exchange, 132 E. 125th street, to 203 E. 124th street;

To run a wire from its Exchange, 132 E. 125th street, to 157 E. 125th street;

To run a wire from its Exchange, 132 E. 125th street to 11 E. 124th street;

To run a wire from its Exchange, 132 E. 125th street, to 771 E. 165th street;

To run a wire from its Exchange, 132 E. 125th street, to 123d street and Lenox avenue;

To run a wire from its Exchange, 132 E. 125th street, to 2002 Seventh avenue;

To run a wire from its Exchange, 132 E. 125th street, to 125th street and Seventh avenue;

To run a wire from its Exchange, 132 E. 125th street, to 205 W. 131st street;

To run a wire from its Exchange, 132 E. 125th street, to 2312 Third avenue;

To run a wire from its Exchange, 132 E. 125th street, to 609 E. 139th street;

To run a wire from its Exchange, 132 E. 125th street, to 245 W. 125th street;

To run a wire from its Exchange, 132 E. 125th street, to 130th street and 12th avenue;

- To run a wire from its Exchange, 132 E. 125th street, to No. 4 Hall Place;
To run a wire from U. G. ter., 32d street and Sixth avenue, to Pier 62, North River;
To run a wire from U. G. ter., 32d street and Sixth avenue, to 32d street and East River;
To run a wire from U. G. ter., 32d street and Sixth avenue, to 415 W. 32d street;
To run a wire from U. G. ter., 27th street and Sixth avenue, to 556 W. 27th street;
To run a wire from U. G. ter., 4th street and Sixth avenue, to 66 W. 3d street;
To run a wire from U. G. ter., 19th street and Sixth avenue, to 36 W. 19th street;
To run a wire from U. G. ter. at 27th street and Sixth avenue, to 151 W. 28th street;
To run a wire from U. G. ter., 15th street and Sixth avenue, to 38 W. 14th street;
To run a wire from U. G. ter., 18th street and Seventh avenue, to 445 W. 16th street;
To run a wire from U. G. ter., 42d street and Madison avenue, to 120 E. 42d street;
To run a wire from U. G. ter., 27th street and Sixth avenue, to 154-156 W. 27th street;
To run a wire from U. G. ter., 18th street and Seventh avenue, to 165 W. 18th street;
To run a wire from U. G. ter., 58th street and Third avenue, to 61st street and East River;
To run a wire from U. G. T., 3d avenue and 58th street, to 1112 Third avenue;
To run a metallic circuit from U. G. T., 58th street and Third avenue, to 424 E. 53d street;
To run a wire from U. G. T., 58th street and Ninth avenue, to 555 W. 55th street;
To run a wire from U. G. T., 58th street and Ninth avenue, to 1205 Ninth avenue;
To run a wire from U. G. T., 58th street and Ninth avenue, to 70 W. 104th street;
To run a wire from U. G. T., 58th street and Ninth avenue, to 72d street and Ninth avenue;
To run a wire from U. G. T., 60th street and Tenth avenue, to 125 W. 86th street;
To run a wire from U. G. T., 60th street and Tenth avenue, to 65th street, between Ninth and Tenth avenues;
To run a wire from U. G. T., 59th street and Tenth avenue, to 156 W. 54th street;
To run a wire from U. G. T., 59th street and Tenth avenue, to corner of 81st street and Ninth avenue;
To run a wire from U. G. T., 59th street and Tenth avenue, to 59th street and North River;
To run a wire from U. G. T., 58th street and Tenth avenue, to 577-579 Tenth avenue;
To run a wire from U. G. T., 60th street and Tenth avenue, to 67th street and Eleventh avenue;
To run a wire from 132 E. 125th street to 136th street and Harlem River;
To run a wire from 132 E. 125th street to 135th street and Fourth avenue;
To run a wire from 132 E. 125th street to 245 W. 125th street;
To run a wire from 132 E. 125th street to 202 W. 125th street;
To run a wire from 132 E. 125th street to 205 W. 131st street;

To run a wire from 132 E. 125th street to 118th street and Seventh avenue;

To run a wire from 132 E. 125th street to 122d street and 2d avenue;

To run a wire from 132 E. 125th street to 210 E. 125th street;

To run a wire from 132 E. 125th street to Lexington avenue, down Lexington avenue to 123d street, housetops east to 204 E. 123d street;

To run a wire from 132 E. 125th street to Lexington avenue, down Lexington avenue to 120th street, through 120th street to Eighth avenue, up Eighth avenue to 125th street, housetops to 245 W. 125th street;

To run a wire from the Cable House, Willis avenue and Harlem River, to 165th street and Third avenue;

To run a wire from U. G. T., 4th street and Sixth avenue, to Pier 56, North River;

To run a metallic circuit from U. G. T., 32d street and Sixth avenue, to Manhattan Market;

To run a wire-metallic circuit from U. G. T., 27th street and Sixth avenue, to 257 Fifth avenue;

To run a wire from U. G. T., 32d street and Sixth avenue to 20 Manhattan Market;

To run a wire from U. G. T., 38th street and Eighth avenue, to 632 W. 34th street;

To run a wire from U. G. T., 38th street and Eighth avenue, to 632 W. 34th street;

To run a wire from U. G. T., 14th street and Sixth avenue, to 455-457 W. 14th street;

To build a metallic circuit from foot of Bethune street to the U. G. T., 12th street and Sixth avenue, as follows: On 12th street, west, from Sixth avenue to Seventh avenue, south on Seventh avenue to West 11th street, west on West 11th street to 13th avenue, north on 13th avenue to Bethune street;

To run a wire across 22d street, from S. E. corner Fifth avenue to N. E. corner;

To run a wire from 525 W. 32d street to 517 W. 33d street;

To run a wire from U. G. T., Spring and West streets, to 56 Lawton avenue, West Washington Market;

To run a wire from U. G. T., 18th street and First avenue, to foot of E. 38th street;

To run a wire from U. G. T., Spring and West streets, to 20 Eighth avenue;

To run a wire from U. G. T., Water street and Burling Slip, to 195 Water street;

To run a wire from U. G. T., 152 Water street, to 82 Wall street;

To run a wire from U. G. T., 156 William street, to 81 Fulton street;

To run a wire from U. G. T., Cortlandt and West streets, to 90 Vesey street;

To run a wire from U. G. T., corner of Spring and West streets, to 4 and 10 Thompson avenue, W. W. Market;

To run a wire from U. G. T., S. W. corner Maiden Lane and Water street, to N. W. corner Maiden Lane and Water street;

To run a wire from U. G. T., 21 College Place, to 70 Warren street;

To run a wire from U. G. T., 58th street and Third avenue, to 429 E. 53d street;

To run a wire from U. G. T., Chrystie and Delancey streets, to 26 Avenue A;

To build a metallic circuit from 424 E. 53d street to U. G. T., 58th street and Third avenue, as follows: East on 58th street to Second avenue, south on Second avenue to

56th street, east on 56th street to First avenue, south on First avenue to 53d street, housetop to subscriber;

To run a wire from 132 E. 125th street, through 125th street to the Harlem River, thence through Cable under River to Willis avenue, up Willis avenue to 146th street, through 146th street to St. Ann's avenue, up St. Ann's avenue to 163d street to Third avenue, up Third avenue to 170th street, through 170th street to Railroad avenue, up Railroad avenue to subscriber's place, 1845 Railroad avenue;

To build a metallic circuit from 208 Avenue A to the U. G. T., 18th street and First avenue, as follows: South on First avenue to 13th street, east on 13th street to Avenue A, south on Avenue A to subscriber;

To build a metallic circuit from 20 Greene street to the U. G. T., Spring and Wooster streets, as follows: South on Wooster street to 21 Wooster street, then house-tops to subscriber;

To run a wire from 606 Grand street to 189 Bowery;

To run a wire from U. G. T. at Spring and West streets to foot of Bethune street, met. circuit wire:

To run a wire from U. G. T. at Spring and Elizabeth street to 229 Bowery;

To run a wire from 154 Clinton street to 21 Suffolk street;

To run a wire from 132 East 125th street to the foot of East 138th street;

To run a wire from 132 East 125th street to Lexington avenue, down Lexington avenue to 120th street, through 120th street to Eighth avenue, up Eighth avenue to 130th street, housetops to 2207 Seventh avenue;

To run a wire from 132 East 125th street to Lexington avenue, down Lexington avenue to 120th street, through 120th street to Tenth avenue, up Tenth avenue to 132d street, through 132d street, housetops to North River,

be granted.

Unanimously adopted.

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated August 16th, 1889, to change the location of not to exceed nine (9) poles from the present route of the Kingsbridge line, at Kingsbridge, to the Kingsbridge road temporarily, for the purpose of enabling the United States Government to cut through the Ship Canal, be granted.

Unanimously adopted.

Commissioner Gibbens, in connection with some applications to replace old poles with new ones engaging the attention of the Board, offered the following resolution:

Resolved, That the Secretary be authorized to issue to duly authorized companies making application therefor permits to erect new of the same size poles in place of old poles, upon the endorsement of the Engineer of the Board to the effect that he has inspected such poles and found them to be in a dangerous condition.

Unanimously adopted.

Mayor Grant offered the following resolutions:

Resolved, That applications of the United States Illuminating Company to connect with its circuits electric lamps at the following places:

Broadway, numbers 270, 247, 243, 204, 203, 202, 201, 182, 180, 177 and 179, corner of Broadway to 8 Murray street, 731 Broadway, 612 Broadway, Bowery, numbers 175, 181, 177, 121, 157, 140, 370, 372, 32½, 272, 174, 306, 214, 342, 338, 152, Broadway, numbers 727, 732, 623, 633, 622, 630, 640, 687, 395 Eighth avenue, 416 Grand street, 7 Warren street, 17 Warren street, 23 Warren street, 74 East 4th street,

be granted.

Unanimously adopted.

Resolved, That permits issue to the United States Illuminating Company to connect with existing circuits City lamps, as per contract awarded by the Department of Public Works July 31, 1889, at the following places:

SIXTH AVENUE.

S. E. corner of Minetta Lane,
Opposite 3d street, west side,
N. E. corner of 4th street,
N. W. corner of Washington Place,
N. E. corner of Waverly Place,
Opposite 8th street, West side,

N. E. corner of 9th street,
N. W. corner 10th street,
N. E. corner of 11th street,
N. W. corner 12th street,
S. E. corner of 13th street.

AVENUE B.

N. W. corner of 2d street,
N. E. corner of 3d street,
N. W. corner of 4th street,

N. E. corner of 5th street,
N. W. corner of 6th street,

CHRISTOPHER STREET.

Opposite No. 166,
N. E. corner of Washington street,
S. W. corner of Greenwich street,

S. W. corner of Hudson street,
Opposite No. 127,
Opposite No. 110.

HOUSTON STREET.

N. W. corner of Avenue C,
S. W. corner of Ridge street,
Opposite No. 316,
S. W. corner of Clinton street,
Opposite No. 276,
S. E. corner of Norfolk street,

S. E. corner of Ludlow street,
Opposite No. 194,
S. W. corner of Forsyth street,
S. E. corner of Allen street,
N. W. corner Second avenue,
Opposite No. 158.

PARK ROW.

Opposite No. 25,	Opposite No. 138,
S. W. corner of Mail street,	Opposite No. 127,
Opposite Frankfort street, west side,	N. E. corner of Pearl street,
Opposite No. 65,	N. W. corner of Baxter street,
City Hall Square sidewalk,	Opposite No. 193,
N. E. corner of North William street,	N. W. corner of Mulberry street,
S. W. corner of Reade street,	Opposite No. 225.

BOWERY.

N. W. corner of Doyer street,	Opposite No. 210,
N. E. corner of Bayard street,	Opposite No. 227,
S. W. corner of Pell street,	N. W. corner of Prince street,
Opposite No. 48,	Opposite No. 264,
S. E. corner of Canal street,	S. E. corner of Houston street,
Opposite No. 76,	S. E. corner of 1st street,
N. E. corner of Hester street,	N. E. corner of 2d street,
Opposite No. 102,	Opposite No. 238,
S. W. corner of Grand street,	N. E. corner of 3d street,
Opposite No. 143,	Opposite No. 256,
S. W. corner of Broome street,	N. W. corner of 4th street,
Opposite No. 169,	S. E. corner of 5th street,
Opposite No. 176,	N. E. corner of Stanton street,
Opposite No. 195½,	Opposite No. 298.

THIRD AVENUE.

S. E. corner of 6th street,	S. W. corner of 22d street,
S. W. corner of 7th street,	S. W. corner of 24th street,
S. E. corner of 8th street,	S. E. corner of 25th street,
N. W. corner of 8th street,	S. W. corner of 26th street,
N. E. corner of 9th street,	S. E. corner of 27th street,
N. W. corner of 10th street,	S. W. corner of 28th street,
N. E. corner of 11th street,	S. E. corner of 29th street,
N. W. corner of 12th street,	S. W. corner of 30th street,
N. E. corner of 13th street, S. E. corner	S. E. corner of 31st street,
of 15th street,	S. W. corner of 32d street,
S. W. corner of 16th street,	S. E. corner of 33d street,
S. E. corner of 17th street,	S. E. corner of 35th street,
S. W. corner of 18th street,	S. W. corner of 36th street,
S. E. corner of 19th street,	S. E. corner of 37th street,
S. W. corner of 20th street,	S. W. corner of 38th street,
S. E. corner of 21st street,	S. E. corner of 39th street.

S. W. corner of 40th street,
S. E. corner of 41st street,
S. E. corner of 43d street,
S. W. corner of 44th street,
S. E. corner of 45th street,
S. W. corner of 46th street,
S. E. corner of 47th street,
S. W. corner of 48th street,
S. E. corner of 49th street,
S. W. corner of 50th street,
S. E. corner of 51st street,
N. W. corner of 52d street,
S. E. corner of 53d street,
S. W. corner of 54th street,
S. E. corner of 55th street,
S. W. corner of 56th street,
S. E. corner of 57th street,
S. W. corner of 58th street,
S. E. corner of 60th street,
S. W. corner of 61st street,
S. E. corner of 62d street,
S. W. corner of 63d street,

S. E. corner of 64th street,
S. W. corner of 65th street,
S. E. corner of 66th street,
S. W. corner of 67th street,
S. E. corner of 68th street,
S. W. corner of 69th street,
S. E. corner of 70th street,
S. W. corner of 71st street,
S. E. corner of 72d street,
S. W. corner of 73d street,
S. E. corner of 74th street,
S. W. corner of 75th street,
S. E. corner of 76th street,
S. W. corner of 77th street,
S. E. corner of 78th street,
S. W. corner of 79th street,
S. E. corner of 80th street,
S. W. corner of 81st street,
S. E. corner of 82d street,
S. W. corner of 83d street,
S. E. corner of 84th street,
S. W. corner of 85th street.

CENTRE STREET.

S. W. corner of Broome street,
Opposite No. 202,

Opposite Hester street, west side.

GRAND STREET.

Opposite Tompkins, on south side,
N. E. corner of Mangin street,
Opposite No. 577,
S. W. corner of Madison street,
N. W. corner of Lewis street,
S. E. corner of Jackson street,
N. W. corner of Columbia street,
N. W. corner of Willet street,
S. W. corner of Division street,
N. W. corner of Ridge street,
S. W. corner of Attorney street,
N. W. corner of Clinton street,
N. W. corner of Suffolk street,
N. W. corner of Norfolk street,

S. W. corner of Essex street,
N. W. corner of Ludlow street,
S. E. corner of Orchard street,
N. W. corner of Allen street,
S. W. corner of Eldridge street,
N. W. corner of Forsyth street,
S. W. corner Chrystie street,
N. E. corner of Elizabeth street,
S. E. corner of Mott street,
N. E. corner of Mulberry street,
S. E. corner of Baxter street,
S. W. corner of Centre street,
N. W. corner of Elm street,
N. W. corner of Crosby street.

EIGHTH AVENUE,

N. W. corner of 15th street,	S. E. corner of 36th street,
N. E. corner of 16th street,	S. W. corner of 37th street,
N. W. corner of 17th street,	S. E. corner of 38th street,
N. E. corner of 18th street,	S. W. corner of 39th street,
N. W. corner of 19th street,	S. E. corner of 40th street,
N. E. corner of 20th street,	S. W. corner of 41st street,
N. W. corner of 21st street,	S. E. corner of 43d street,
N. E. corner of 22d street,	S. E. corner of 44th street,
S. W. corner of 24th street,	S. W. corner of 45th street,
S. E. corner of 25th street,	S. E. corner of 46th street,
S. W. corner of 26th street,	S. W. corner of 47th street,
S. E. corner of 27th street,	S. E. corner of 48th street,
S. W. corner of 28th street,	S. W. corner of 49th street,
S. E. corner of 29th street,	S. E. corner of 50th street,
S. W. corner of 30th street,	S. W. corner of 51st street,
S. E. corner of 31st street,	S. E. corner of 52d street,
S. W. corner of 32d street,	S. W. corner of 53d street,
S. E. corner of 33d street,	S. E. corner of 54th street,
S. W. corner of 35th street,	S. W. corner of 55th street,

PARK ROW,

N. W. corner of Mott street.

Unanimously adopted.

Resolved, That the application of the Harlem Lighting Company, dated August 13th, 1889, to connect existing lines on First Avenue with No. 1655 First Avenue—being for lamp connection only—be granted.

Unanimously adopted.

Resolved, That the applications of the Manhattan Electric Light Company, Limited, to connect existing lines with 288 and 357 Eighth avenue, and 632 and 717 Broadway—being for lamp connections only—be granted.

Unanimously adopted.

Resolved, That the application of the East River Electric Light Company to connect with existing circuits electric lights at 953 Third avenue, 147 Third avenue, 594 Third avenue, 118 Third avenue, 515 East 19th street, 418 Eighth avenue, 959 Third avenue, 284 Grand street, 182 Avenue B, 222 Avenue B, 278 Third avenue, 1080 Third avenue, 187 Avenue B, 278 First avenue and 443 First avenue, be granted.

Unanimously adopted.

Resolved, That the applications of the Mount Morris Electric Light Company to connect with its circuits electric lamps at the following places:

60 Dey street, 837 Washington street, 40 Gansevoort street, 197 West street, 198 Greenwich street, 369 Greenwich street, 310 Washington street, 201 Duane street, 101 Hudson street, 311 Ninth avenue, 2435 Eighth avenue, 90 Vesey street, be granted.

Unanimously adopted.

Resolved, That the application of the Brush Electric Illuminating Company, dated August 17th, 1889, for overhead connections at 220 Bowery, and to hang lamps in posts in front of Union Square Theatre, 56 East 14th street, be laid over.

Unanimously adopted.

Resolved, That the application of the United States Illuminating Company, dated August 16th, 1889, to place wires on existing poles in order to connect its lighting stations with subways, as to the portion thereof numbered "2" in the words and figures following:

"From Stanton street station.

"Through Forsyth street, Houston street, Second avenue, Fourth street, Third avenue, Eighth street and Fourth avenue to Fourteenth street, 5 pairs of wires.

"Through Forsyth street, Houston street, Second avenue, Sixth street and Third avenue to Fourteenth street, 6 pairs of wires.

"Through Chrystie street, Second avenue, Fourth street, Third avenue and Eighth street to Broadway, 2 pairs of wires,"

be granted; provided, however, that the number of wires shall be determined by Expert Wheeler, and shall not be greater than those with which connection is to be made in the subways, unless to make the overhead wires equal in capacity to those underground; and, as to the remaining portion thereof, be laid over.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, September 12th, 1889, at 12 o'clock, M.

Present: Mayor Hugh J. Grant, President; Commissioner Jacob Hess, Commissioner Daniel L. Gibbens, Commissioner Theodore Moss.

The minutes of the last meeting were read and approved.

The following communication from the Dexter Stock Indicator and Telegraph Company, No. 115 Broadway, was read:

NEW YORK, September 5th, 1889.

To The Board of Electrical Control, New York City.

GENTLEMEN:—The Dexter Stock Indicator and Telegraph Company respectfully requests from your Honorable Board the right to string upon the frames of other stock quotation companies, already erected upon the tops of houses by consent of the owners, four wires of small copper thoroughly insulated, from the Consolidated Stock and Petroleum Exchange, No. 60 Broadway, to any point below 42d street in this city where such frames are already in existence. The object of these wires is to furnish to hotels and brokers who have already applied for instruments, instantaneous quotations of the prices of petroleum and other products as soon as sales are made. The electric current for these wires is generated by small cells, and is no stronger than is required for telephone wires, being only used to open and close the armatures of small magnets which regulate a clockwork to change the indicators.

Very respectfully, Your obedient servant,

W. COURTENAY, Gen'l Manager.

Commissioner Gibbens offered the following resolution:

Resolved, That the Secretary be directed to write to The Dexter Stock Indicator and Telegraph Company and state that, as the Company has no franchise, before application can be entertained by the Board such franchise is requisite.

Unanimously adopted.

Resolved, That the Secretary be directed to invite the attention of the Police Commissioners to the fact that violations of the law relating to electrical conductors in the City of New York are occurring in the city, and instance the cases of the electric light companies which we found violating the law during the last two weeks and, also, the case of the messenger call companies who offer facilities to customers without any permits for the work that they propose to do.

Unanimously adopted.

The following communications were read:

SEPTEMBER 12, 1889.]

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SEPT. 10th, 1889.

MR. J. B. TRAINER, Asst. Secretary Board of Electrical Control:

SIR:—I am instructed by the District Attorney to acknowledge the receipt of your communication of the 7th inst. enclosing report of Inspector Roth, and to state that he will give the matter referred to his immediate attention.

Yours truly,

WILLIAM N. PENNEY, Secretary.

NEW YORK, September 10th, 1889.

J. B. TRAINER, ESQ., Assistant Secretary, Board of Electrical Control, 1266 Broadway, New York City:

DEAR SIR:—I have your favor of 9th inst. covering complaint of Inspector George W. Roth that our men had run 150 feet of wire across Broadway to connect at 622 Broadway, on the 4th inst.; and in reply would state that we find upon investigation our repairmen cut in this lamp from existing wires (not running across the street) in error, supposing that a permit was granted September 3d, when in fact application was made on that day. We shall discontinue the use of this lamp until such time as permit is granted. There was no intention on our part to disregard existing regulations.

Very truly yours,

BRUSH ELECTRIC ILLUMINATING CO.,

by CHAS. W. SPEAR.

Commissioner Gibbens: That seems hardly enough. The Company should remove the lamp and the wire put in there. If its letter is in good faith it should remove the lamp—not discontinue the use of it.

Mayor Grant: It has gone to the Grand Jury, has it not?

Commissioner Gibbens: No, sir; to the District Attorney's office.

Mayor Grant: I think there is sufficient cause to indict the Company. I don't think we ought to take any action at all.

Commissioner Moss: I move:

Resolved, That the communication of the Brush Electric Illuminating Company, dated September 10th, 1889, relative to the complaint of Inspector Roth, be spread upon the minutes, and a copy of the same be transmitted to the District Attorney.

Unanimously adopted.

The following communication from the Metropolitan Telephone and Telegraph Company was read:

NEW YORK, Sept. 9th, 1889.

Honorable Board of Electrical Control, 1266 Broadway, New York:

GENTLEMEN:—I beg to call your attention to the enclosed copy of a letter written to you by our General Manager Eckert on August 14th applying for the privilege of stringing thirty wires upon our pole line between 58th street and the Bronx River on Third avenue for long distance service to New Haven, Providence and Boston.

I am informed by Gen. Manager Eckert that he understood these applications to have been granted at the last meeting of the Board with other applications of this Company, but that no permit for the stringing of these wires has been issued. Will you kindly give the matter early attention and forward the permits to us if they were granted.

The service requires these additional wires, and we would be glad to get them up if we are allowed to do so.

Your early reply will oblige,

Very truly yours,

CHARLES F. CUTLER, Vice-President.

Mayor Grant offered the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated August 14, 1889, to string 30 wires between 58th street and the Bronx River, on Third avenue, for long-distance service to New Haven, Providence and Boston, be laid over.

Unanimously adopted.

Commissioner Hess moved the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated September 12, 1889, to string two wires on Tenth avenue from 130th street to 176th street, be granted.

Unanimously adopted.

The following communication was read:

NEW YORK, August 30, 1889.

HON. HUGH J. GRANT, Mayor, and Chairman Board of Electrical Control:

SIR:—The Board of Estimate and Apportionment, at a meeting held on the 29th inst., authorized to be repaved with asphalt on the present stone block pavement, the streets specified in the accompanying list, which is supplemental to the resolutions already sent you. These repavements will be put under contract at an early date, and, in order that the new pavements may remain undisturbed as long as possible, I respectfully request that all work on electric subways and connections in these streets, now

required or contemplated, be proceeded with at once. This Department intends to issue no permits for new underground constructions after the new pavements are laid, and for repairs only in cases of absolute and immediate necessity.

Very respectfully,

THOS. F. GILROY, Commissioner of Public Works.

Streets authorized to be repaved with a surface of asphalt on the present stone block pavement, by the Board of Estimate and Apportionment, August 29th, 1889:

25th street, between Broadway and Sixth avenue,
32d street, between Madison and Fifth avenues,
33d street, between Fourth avenue and Broadway,
36th street, between Fourth and Sixth avenues,
37th street, between Fourth and Sixth avenues,
38th street, between Fifth and Sixth avenues,
38th street, between Fourth and Madison avenues,
40th street, between Fourth and Fifth avenues,
43d street, between Madison and Fifth avenues,
46th street, between Madison and Sixth avenues,
47th street, between Madison and Sixth avenues,
48th street, between Madison and Sixth avenues,
60th street, between Fourth and Fifth avenues,
67th street, between Fourth and Fifth avenues,
68th street, between Park and Fifth avenues,
Lexington avenue, between 21st and 32d streets, and between 66th and 69th streets.

Mayor Grant stated that he did not think there was any possible contingency in which he would vote for the opening of a street after this new pavement was put down, and moved the following resolution:

Resolved, That copies of the communication of the Commissioner of Public Works, dated August 30th, 1889, read at this meeting, containing list of streets about to be repaved, be sent to the Consolidated Telegraph and Electrical Subway Company and to the Edison Electric Illuminating Company.

Unanimously adopted.

The following application from the Consolidated Telegraph and Electrical Subway Company was read:

NEW YORK, N. Y., September 11, 1889.

To the Honorable, the Commissioners of the Board of Electrical Control, Hon. HUGH J. GRANT, President, No. 1266 Broadway, New York, N. Y.:

GENTLEMEN:—We beg to submit herewith the following lines of electrical subways, for your approval and authorization, to be constructed during the present season, for which we ask your favorable consideration:

1. An electric light subway on the north side of 47th street, from 100 feet east of Fifth avenue to the west side of Sixth avenue.

2. An electric light subway on the south side of 48th street, from the west side of Fifth avenue to the west side of Sixth avenue.

3. An electric light subway on the south side of 54th street, from the west side of Sixth avenue to the east side of Madison avenue.

The construction of all the above lines will consist of the special tubing of the Edison Electric Illuminating Company, and they are needed at this time to meet the special requirements of that Company.

Map showing the location of these subways is submitted herewith.

Very truly yours,

EDWARD LAUTERBACH, President.

Mayor Grant offered the following resolution:

Resolved, That the application of the Consolidated Telegraph and Electrical Subway Company, dated September 11th, 1889, for approval and authorization of certain subway construction therein particularly specified, material to consist of the special tubing of the Edison Electric Illuminating Company and to meet the requirements of that Company, be granted; upon condition, nevertheless, that the work be completed by December 1st, 1889.

Unanimously adopted.

The following report of Engineer Kearny was read:

NEW YORK, Sept. 12, 1889.

To the Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN:—I have to recommend that you order for construction during this season the following subways:

For Electric Light Service:

A crossing of Sixth avenue at 29th St. and 38th St.

The extension of subway on north side of 125th street, from Second to First avenue. Lenox avenue, from 125th street to 122d street.

And in Washington street from Cortlandt street north to Fulton, and through Fulton street east to Broadway, to connect with the subway now building on Broadway, for similar service.

All the above construction to consist of iron tubes laid in hydraulic cement, approximately ten in number, the number to be increased if the requirements necessitate it.

For Telephone and Telegraph Service:

A crossing of Broadway at Liberty street.

I must again report my recommendation of August 15th for new work, as the season for doing work will soon be over, and some of the streets will be repaved by the Commissioner of Public Works this season.

The work of construction of subways is progressing satisfactorily, and I can report the work on 29th street from First to Fifth avenue as about completed and ready to receive wires of Electric Light Companies from First to Fourth avenues, and the abandonment of the pole lines in 27th, 28th, 29th and 30th streets between those avenues.

Very respectfully,

HENRY S. KEARNY, Engineer of Board.

The Board took up the consideration of this report of Engineer Kearny, also, the consideration of his report of August 15th, 1889, brought up, discussed and laid over at the meeting of that date, and, after considerable discussion,

Mayor Grant offered the following resolution:

Resolved, That the two reports of Engineer Kearny, dated respectively August 15th and September 12th, 1889, be referred back to him for revision, to be reported back to the Board at a later stage of this meeting.

Unanimously adopted.

The following communication from the New York Atmospheric Conduit Electric Light and Power Company was read:

OFFICE, 145 BROADWAY,

NEW YORK, September 5th, 1889.

To the Honorable the Board of Electrical Control:

The "New York Atmospheric Conduit Electric Light and Power Company" petitions your Honorable body to grant to this Company the privilege of constructing a system of conduits on the Boulevard for the furnishing of electric light for the street, and to the residents in that vicinity.

This Company will enter into an agreement to construct a conduit which will be impervious to gases and moisture, and which will be thoroughly ventilated so as to prevent condensation on the conductors, and built of such materials and in such a manner as may never require to be opened for alterations, operating or repair.

The space required for the conduit will not exceed 2x3 feet in dimensions, and will be constructed on the curb line of the street immediately under the gutter.

We will furnish reference to where this system has been four years in operation with the most gratifying success.

Yours very respectfully,

HENRY B. MURRAY, President N. Y. A. C. E. L. & P. Co.

Mayor Grant offered the following resolution:

Resolved, That the petition of the New York Atmospheric Conduit Electric Light and Power Company, dated September 5th, 1889, for grant of privilege of constructing

a system of Conduits on the Boulevard for the furnishing of electric light for the street and to the residents in that vicinity, be referred to Commissioner Gibbens.

Unanimously adopted.

Commissioner Gibbens reported favorably to the granting of the application of the Mount Morris Electric Light Company, referred to him at a previous meeting, to run one wire from its station in Vandam street, through Greenwich street and Ninth avenue, to connect with subway in 125th street, stating that a like application of the United States Illuminating Company to string wires in another territory had theretofore been granted by the Board, and

Mayor Grant offered the following resolution:

Resolved, That the application of the Mount Morris Electric Light Company to run one wire from its station in Vandam street, through Greenwich street and Ninth avenue, to connect with subway in 125th street, be granted.

This resolution was unanimously adopted, but was afterward, on motion of His Honor the Mayor, reconsidered and rescinded.

The application was considered anew, and, after a brief discussion,

Commissioner Hess moved:

Resolved, That the application of the Mount Morris Electric Light Company to run one wire from its station in Vandam street, through Greenwich street and Ninth avenue, to connect with 125th street subway, be referred to Expert Wheeler to find out and report to the Board whether a wire can be run any reasonable distance to make the desired connection.

Unanimously adopted.

The Board hereupon took up the consideration of the report of Engineer Kearny, reported back to the Board by him revised—

The one dated August 15, 1889, by striking therefrom the following matter:

"An extension of the 79th street subway from Fourth avenue to Fifth avenue and from First avenue to Avenue A. Also";

And the one dated September 12, 1889, by striking therefrom:

"The extension of subway on north side of 125th street from Second to First avenue.

"Lenox avenue from 125th street to 122d street. And in Washington street from Cortlandt street north to Fulton, and through Fulton street east to Broadway, to connect with the subway now building on Broadway, for similar service."

And, after some discussion, more particularly as to the advisability of including in the revised reports the extension of the 79th street subway,

Mayor Grant moved the following resolution:

Resolved, That the reports of Engineer Kearney, as revised, dated respectively August 15, 1889, and September 12, 1889, be approved, and that the subways therein recommended for construction be ordered.

Unanimously adopted.

The following application was read:

NEW YORK, August 15th, 1889.

To the Hon. Board of Electrical Control:

GENTLEMEN:—The undersigned respectfully applies for permission "in order to support existing electric light conductors" to erect small electric light poles or to trim existing poles to a suitable size as may be directed by the Engineer of the Board of Electrical Control, on Sixth avenue from 14th street to Carmine street.

Very respectfully,

EAST RIVER ELECTRIC LIGHT CO.

E. E. DEXTER, Supt.

Mayor Grant offered the following resolutions:

Resolved, That the application of the East River Electric Light Company, dated August 15, 1889, to erect small electric light poles or to trim existing poles to a suitable size, on Sixth avenue from 14th street to Carmine street, be referred to Commissioner Gibbens.

Unanimously adopted.

Resolved, That application of the Metropolitan Telephone and Telegraph Company, as follows:

- To run a wire from U. G. T. at 132 E. 125th street to 152 W. 127th street;
- To run a wire from U. G. T. at 132 E. 125th street to 2207 Fifth avenue;
- To run a wire from 132 E. 125th street to 62 W. 125th street;
- To run a wire from 132 E. 125th street to 259 W. 121st street;
- To run a wire from 132 E. 125th street to 149 West 125th street;
- To run a wire from U. G. T., 58th street and Fourth avenue, to 733 Madison avenue;
- To run a wire from U. G. T. at 58th street and Eighth avenue to 55 W. 55th street;
- To run a wire from U. G. T. at Broadway and 13th street to 136 E. 14th street;
- To run a wire from U. G. T. at 58th street and Third avenue to 447 and 449 E. 52d street;
- To run a wire from U. G. T. at 32 Broadway to 34 Washington street;
- To run a wire from U. G. T. at 92 Front street to 97 Front street;
- To run a wire from U. G. T. at 35 Frankfort street to 45 and 51 Rose street; and

To run a wire from U. G. T. at 13th street and Broadway to 65 Fifth avenue (met. circuit wire),

be granted.

Unanimously adopted.

Expert Wheeler stated in reference to some other applications of the Metropolitan Telephone and Telegraph Company that they had been received too late for investigation and report.

These applications, on motion of Mayor Grant, were laid over.

Mayor Grant moved the following resolution:

Resolved, That the three applications of the East River Electric Light Company, dated respectively July 12, 1889, and its two applications, dated respectively July 22d, 1889, and July 24th, 1889, to string wires, etc., as therein respectively specified, be referred to Expert Wheeler.

Unanimously adopted.

Commissioner Gibbens moved the following resolutions:

Resolved, That the applications of the East River Electric Light Company to connect electric lamps with existing circuits, at

37 Avenue A,	132 Avenue D,
503 Third avenue,	1074 Third avenue,
142 Bowery,	10 Union Square,
658 Third avenue,	18 Bowery,
1070 Third avenue,	293 Third avenue,
220 Third avenue,	1078 Third avenue,
337 Third avenue,	

be granted.

Unanimously adopted.

Resolved, That the applications of the United States Illuminating Company to connect electric lamps with circuits, at the following places:

405 Grand street,	44 Exchange Place,
801 Eighth avenue,	125 Walker street,
602 Grand street,	19 Beaver street,
72 Broadway,	264 East Houston street,
496 Grand street, 700 Third avenue,	262 East Houston street,
199 Broadway,	272 East Houston street,
37 Nassau street,	85 Warren street,
40 New street,	18 Warren street,

- 50 Warren street,
 31 Warren street,
 57 Warren street,
 28 Warren street,
 307 Broadway,
 377 Broadway,
 390 Broadway,
 548 Broadway,
 132 Essex street,
 84 Catharine street,
 476 Grand street,
 570 Grand street,
 188 Grand street,
 29 Warren street,
 85 Second Avenue,
 374 Broadway,
 38 Warren street,
 456 Grand street,
 157 Bowery,
 239 Broadway,
 11 University Place,
 426 Third avenue,
 3 Hudson street,
 174 Washington street,
 257 Bowery,
 11 Warren street,
 131 Fulton street,
 21 Warren street,
 325 Grand street,
 26 Cortlandt street,
 25 Bowery,
 121 E. 11th street,
 10 Warren street,
 8 Dey street,
 429 Eighth avenue,
 26 Warren street,
 39 Warren street,
 45 Warren street,
 40 Warren street,
 119 E. 11th street,
 424 Fourth avenue,
 N. W. cor. 17th street and Fourth
 avenue,
- 345 Eighth avenue,
 99 Spring street,
 125 Grand street,
 318 Fourth avenue,
 29 Ann street,
 82 Nassau street,
 145 Fulton street,
 201 Broadway,
 169 Broadway,
 305 Broadway,
 383 Broadway,
 397 Broadway,
 405 Broadway,
 Corner of Broadway and Cortlandt
 street,
 2 Astor House,
 5 Astor House,
 7 Astor House,
 8 Astor House,
 297 Broadway,
 195 Broadway,
 254 Broadway,
 96 Worth street,
 3 Hudson street,
 28 Duane street,
 11 Chatham Square,
 142 Beekman street,
 33 North Chambers street,
 26 Cortlandt street,
 2 Maiden Lane,
 6 Maiden Lane,
 257 Bowery,
 620 Grand street,
 21 Bowery,
 236 Eighth avenue,
 33 Warren street,
 36 Warren street,
 27 Warren street,
 34 Warren street,
 358 Broadway,
 47 Warren street,
 70 Warren street,
 420 Broadway,

161 Broadway,
327 Grand street,
Corner of Fulton and Greenwich
streets,
62 Fulton street,
Corner of Nassau and Fulton streets,

Corner of Dey and Church streets,
Corner of Fulton and Water streets,
150 Fulton street,
19 Warren street,
41 Cortlandt street,

be granted.

Unanimously adopted.

Resolved, That the applications of the United States Illuminating Company to change connections for lamps from one circuit to another circuit, on same pole line, in front of same premises, now supplied by present connections, at the following places:

Numbers 395, 417, 231, 451, 669, 395, 457, 513, 409, 367, 311, 313, 585, 553, 583, 410, 555, 551, 543, 523, 495, 497, 549, 865, 629, 731, 489, 613, 117, 401 and 226 Eighth avenue and corner of 51st street and Eighth avenue, be granted.

Unanimously adopted.

Resolved, That a permit issue to the United States Illuminating Company to erect a lamp-post at the N. W. corner of Park Row and Mott street, of regulation style, as per plans of the Board.

Unanimously adopted.

Resolved, That the applications of the Mount Morris Electric Light Company to connect electric lamps with circuits, at the following places:

238 and 246 Lenox avenue, 254 and 258 Lenox avenue, 1823 Ninth avenue, 1835 Ninth avenue, 1741 Ninth avenue, 1769 Ninth avenue, 1687 Ninth avenue, 1657 Ninth avenue, 1711 Ninth avenue, 1713 Ninth avenue, 1721 Ninth avenue, 88 Vesey street, corner of West and Barclay streets, 26 Greenwich street, 280 West 125th street, 340 West 125th street, 336 West 125th street, 377 West 125th street, 324 Greenwich street, 49 Broad street, 60 Broad street, 76 and 80 Broad street, 77 and 79 Broad street, 18 Beaver street, 21 Beaver street, 32 Beaver street, 38 Beaver street, 54 Beaver street, 42 Cortlandt street, 51 Cortlandt street, 81 Cortlandt street, 84 Vesey street, 207 Washington street, 523 Greenwich street, 26 Greenwich street, 2292 Eighth avenue, 1213, 1745 and 1689 Ninth avenue, 2435 and 2407 Eighth avenue, 25 Ninth avenue, 144 and 146 West 125th street,

be granted.

Unanimously adopted.

Resolved, That the applications of the Brush Electric Illuminating Company for overhead connections—being lamp only—at

132, 162 and 186 Bowery, 374 Broadway, 687 Eighth avenue, 51 Walker street,

52 Third avenue, 163 and 535 Eighth avenue, 132 and 210 Bowery, 326 Broadway, 376 Canal street, 36 Avenue B, 416 Grand street, 351 Eighth avenue, 263, 415 and 457 Grand street, 210 Fifth avenue, 220 Bowery, 123-125 Walker street, 264½ Bowery and 208 Spring street,

be granted.

Unanimously adopted.

Resolved, That the applications of the Harlem Lighting Company to connect existing lines—being lamp connections only—with

1427 Third avenue,
1453 Third avenue,

2284 Third avenue,
172 E. 125th street,

be granted.

Unanimously adopted.

Resolved, That the applications of the Manhattan Electric Light Company to connect existing lines—being lamp connections only—with

327 Eighth avenue,
238 Eighth avenue,

546 Broadway,

be granted.

Unanimously adopted.

Expert Wheeler stated that there were other applications from electric lighting companies for lamp connections which had been received too late for examination and report, and

These applications, on motion of Mayor Grant, were laid over until the next meeting.

Mayor Grant offered the following resolutions:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated August 16th, 1889, to string an aerial cable from 132 East 125th street to S. E. corner 125th street and Third avenue, lie over until the Company makes a statement in reference to it.

Unanimously adopted.

Resolved, That the application of the Northern New York Lighting Company, dated August 17th, 1889, to string wires in section of the city north of Harlem River therein particularly specified, be referred to Expert Wheeler.

Unanimously adopted.

Resolved, That the application of the Manhattan Electric Light Company to string two new highly insulated No. 2 wires in place of two No. 4 poorly insulated wires, on Third avenue between 5th and 14th streets, be referred to Mr. Wheeler, to report as soon as possible.

Unanimously adopted.

Commissioner Hess: I move that the resolution passed at the last meeting giving the United States Illuminating Company permission to string wires to connect with the subways be revoked.

Commissioner Gibbens: I would like to know if the United States people did not declare that they had wires in the subways in asking for this permit? Let this lie over. Mr. Wheeler is instructed, then, to report on this whole matter at the next meeting.

Mayor Grant: No objection to that in the world.

Commissioner Gibbens: There is another application here from the Manhattan Electric Light Company to string four wires on existing poles, on 80th street, from its station at 80th street and Avenue B to First avenue, and on First avenue from 80th street to 14th street, to connect with cables drawn into subways on 14th street; also six wires on same poles, from Avenue B to First avenue on 80th street, and from 80th street to 42d street on First avenue, to connect with cables laid (and to be laid when subway is entirely completed) on 42d street. Let that take the same course—the whole thing to come up at the same time at the next meeting.

Commissioner Gibbens called up and moved the following resolution laid over at a previous meeting of the Board:

Resolved, That the Rules and Regulations of the Board of Electrical Control relative to the stringing of wires, etc., for electric lighting, be modified as follows:

XXXVIII. The Secretary is authorized to issue permits to properly authorized corporations making application therefor in streets and avenues where no subways have been made ready or in streets and avenues where subways have been prepared in connection with such subways,

- (a). To alter the position of lamps already in place.
- (b). To take down and rehang lamps already in place.
- (c). To rehang old lamps which have temporarily been taken down.
- (d). To transfer connections from one circuit to another.
- (e). To make connections from existing circuits to new customers in the nature of a lamp or motor connection which do not require more than seventy feet of wire.

Provided, in the case of each application it is endorsed and approved as coming within this rule by the Electrical Expert.

Unanimously adopted.

Commissioner Gibbens also called up and moved the passage of the following other resolution laid over at a previous meeting:

Resolved, That the Rules and Regulations for Overhead Wires for Signaling be amended so as to read as follows:

XVII. The Secretary is authorized to issue to companies operating electrical conductors of the first class all permits required by them for the making of connections necessary to the business of said companies with lines now in use, in, over and upon streets and avenues where no subways have been provided, not including the erection of any new poles or similar fixtures, and in accordance with the rules and regulations of the Board: provided, however, that no such permit shall be issued by the Secretary except upon the endorsement of the Electrical Expert to the effect that such applications have been examined and are within the provisions of this rule.

Mayor Grant: Let that resolution lie over, and I will bring it up at the next meeting.

Commissioner Gibbens moved the following resolution:

Resolved, That the Board adjourn subject to the call of the Chair.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, October 9th, 1889, at 1 o'clock P. M.

Present: Mayor Hugh J. Grant, President; Commissioners Daniel L. Gibbens and Theodore Moss.

Mayor Grant: Commissioner Hess sent me a telegram from Boston saying he could not possibly get here, through some accident of the railroad, as I understood it. The reading of the minutes will now be in order.

The minutes of the last meeting were thereupon read, and, on motion of Mayor Grant, were approved.

Mayor Grant: There are some communications here—one in particular sent me from the Coroner's Office—which I would like to have read.

The following communication was then read:

CORONER'S OFFICE, 67 PARK ROW,

NEW YORK, 1889.

We, the jury, find that Joseph Mazza came to his death through an accident which brought him in contact with one or more electric wires at the corner of Houston and Chrystie streets in this city, which caused his death by an electric shock.

While there seems to be no evidence of negligence in this case we deem it our duty to call attention to the fact that owing to the crowded condition of our streets the overhead electric light wires in this city are a constant danger to life, as is attested by the several recent deplorable accidents caused by them.

We therefore earnestly call the attention of the proper city authorities to the necessity of immediate and vigorous action in the direction of placing underground all overhead electric wires in the city.

Mayor Grant: There is with that communication from the Coroner's Office a summary of some deaths caused by electricity, also, of some recent serious accidents caused by it.

The following summary referred to by Mayor Grant was also read:

DEATHS CAUSED BY ELECTRICITY IN NEW YORK CITY SINCE

JUNE 1st, 1889.

Edward Quinn killed by Brush current June 27th.

Darwin Henry killed by East River Co.'s current Sept. 2d.

Joseph Mazzi killed by U. S. Co.'s current Sept. 13th.

— Powers, death caused by shock from Brush current a few days since.

RECENT SERIOUS ACCIDENTS CAUSED BY ELECTRIC CURRENT.

Sept. 21st, John Biel, U. S. lineman, thrown from pole by electric shock and injured seriously and, perhaps, fatally.

July 2d, Thos. Linall seriously injured by an electric light wire on 8th street.

Numerous other minor accidents are not included in this list.

Mayor Grant: That communication from the Coroner's Office caused me to write this communication (referring to his letter book) to the various electric light companies and the Consolidated Telegraph and Electrical Subway Company. The Secretary will please read that (handing him the book).

The following communication referred to by his Honor the Mayor was then read:

NEW YORK, October 8th, 1889.

GENTLEMEN:—The frightful deaths which have recently occurred from contact with electric wires makes it incumbent upon the public authorities, by the exercise of every power conferred upon them by law, to compel the speedy burial of these wires, which are a standing menace to the security of life and limb within the city.

I propose to bring this subject before the Board of Electrical Control on Wednesday, the 9th day of October, 1889, at 1 o'clock P. M., in this office, and I suggest that a representative of your Company be in attendance to make such suggestions as you may think it proper for the Board to consider.

It may be well also to remind you that the city is about to expend a large sum in the improvement of the pavements, and it is my intention to urge upon the Board of Electrical Control the propriety of requiring that subways be completed in all streets which are about to be paved under the application of the laws of 1889, so as to avoid the necessity of disturbing for this purpose the pavement in the future.

Respectfully,

HUGH J. GRANT, Mayor.

The following communications were read:

NEW YORK, Oct. 9, 1889.

HON. HUGH J. GRANT, President Board of Electrical Control:

DEAR SIR:—Replying to your letter referring to the desirability of placing electrical conductors underground, we beg to state that we are in most hearty accord with this policy, and in confirmation of this respectfully refer to the following facts:

First. We have at present conductors in almost every subway ready for occupancy in the city of New York, and have a very large amount of cable in use underground.

Secondly. Many of the subways now being constructed were ordered by your Honorable Board upon urgent request by us, and we have drawn cables in the subways now in the course of construction. We shall make no application for overhead wires except such as may be necessary to connect our station with the subways where we have cable laid ready for use, and should such permission be granted to us, we shall use wire of the highest insulating properties only, from which it will be impossible to receive any shock.

We are convinced that only through the development and extension of underground facilities can our business be done to the satisfaction of ourselves and the entire safety of the community.

Very respectfully,

THE MANHATTAN ELECTRIC LIGHT CO., L^TD.,

By E. A. LESLIE, Gen'l M^gr.

NEW YORK, Oct. 9, 1889.

HON. HUGH J. GRANT, President Board of Electrical Control:

DEAR SIR:—Replying to your letter referring to the desirability of placing electrical conductors underground, we beg to state that we are in most hearty accord with this policy, and in confirmation of this respectfully refer to the following facts:

First. We have at present conductors in almost every subway ready for occu-

pancy in the city of New York, and have a very large amount of cable in use under ground.

Secondly. Many of the subways now being constructed were ordered by your Honorable Board upon urgent request by us, and we have drawn cables in the subways now in the course of construction.

We shall make no application for overhead wires except such as may be necessary to connect our station with the subways where we may have cable laid ready for use, and should such permission be granted to us we shall use wire of the highest insulating properties only, from which it will be impossible to receive any shock.

We are convinced that only through the development and extension of underground facilities can our business be done to the satisfaction of ourselves and the entire safety of the community.

Very respectfully,

THE HARLEM ELECTRIC LIGHT CO.,

By E. A. LESLIE, Gen'l M'gr.

NEW YORK, Oct. 3d, 1889.

HON. HUGH J. GRANT, Mayor, etc., and Chairman of the Board of Electrical Control,
New York City:

DEAR SIR:—We take the liberty of again calling your attention to our urgent need for further facilities for carrying on and extending our business in this city. Our present position is deplorable. Every foot of overhead wire which we have is being used to the fullest capacity possible within the limits of safety, so that a further extension of our business is impossible. Yet we have customers for not far from 20,000 incandescent lights whom we have contracted to supply, and whose premises have been wired at an expense exceeding \$100,000, most of whom for some time have been complaining bitterly at our delay in supplying them with light. Our stations have been equipped with the necessary machinery to supply all these demands. All these preparations are rendered valueless by the fact that we are not given facilities to reach our customers either by overhead wires or underground subways.

Unfortunately, the subways already built have helped us very little, although we have used them wherever possible. There are several reasons for this, among the following:

1st. In many streets the subways which have been built are inadequate for our needs, and we are unable to supply customers merely because all the ducts on these streets are filled. This is the case on 23d street between Broadway and Fourth avenue, Sixth avenue between 24th street and 59th street.

2d. In many of the streets where subways have been built and our pole lines removed distributing ducts have not been built, so that it has been impossible for us to reach many of our customers along these streets. Notable instances under this heading are: Sixth avenue on both sides, and Broadway on both sides from 33d to 59th street. It should also be noted that, although main and partial distributing subways are now being built on the east side of Broadway and on the west side of Third avenue, no distributing ducts are being laid on the opposite side of those

streets. The total number of distributing ducts being built on either side of these streets is less than our Company alone has asked for and requires for immediate use.

3d. The work of extending subways has progressed this season so slowly that almost no new facilities have yet been furnished us. At the rate at which the work is now progressing the limited subways now ordered will not be completed so as to be utilized to any great extent until far into next year at the earliest, and consequently but little relief can be expected from this direction this season. As an illustration of the progress of the present subway work we instance 23d street, where the subway from Fifth avenue to Eleventh avenue was ordered more than a year ago. Over two months since a representative of the Subway Company promised its completion within thirty days. Though the work has been in progress over two months, only that portion between Fifth and Eighth avenues has been completed, and at the present rate it can scarcely be carried beyond Eleventh avenue this season. This delay is an especial hardship upon us, as this subway affords us the only outlet from the station at 24th street and North River, which we are planning to use.

We bring these facts to your attention, feeling that if you fully understand the hardship of our position and the enormous loss which the electric lighting interests of this city are now sustaining you will afford relief by giving us temporary permits for overhead wires to meet pressing needs and allow us the privilege of building at once for our own use such subways as our business imperatively requires. We have the means and the willingness to build all the subways we need if we can only be given the opportunity.

At the last meeting of the Board we submitted a list of the overhead wires most needed. The list was submitted to your Expert for report, and we trust that it will come up for consideration, accompanied by his report, at your next meeting.

We beg to submit the following list of subways which we need at once, and which we will build at our own expense if allowed to do so, viz.:

1. A short subway about 300 feet in length from our station at 29th street and East River, up 29th street to First avenue, there to join the 29th street subway recently built.

2. A subway from the station at 24th street and North River, up 24th street to Eleventh avenue, along Eleventh avenue to 23d street, there connecting with the 23d street subway now being built.

Sixth Avenue.

3. East side, Carmine street to 59th street, 3 distributing ducts. West side, Carmine street to 59th street, 3 distributing ducts.

Madison Avenue.

4. East side, 23d st. to 59th st., 3 distributing ducts. West side, 26th st. to 59th st., 3 distributing ducts.

Fifth Avenue.

5. East side, from Waverly place to 23d st. and from 26th st. to 59th st., 3 distributing ducts. West side, Waverly place to 23d st. and from 25th st. to 59th st., 3 distributing ducts.

Broadway.

6. West side, Battery to 14th st., 4 distributing ducts. West side, 33d st. to 59th st., 3 distributing ducts. East side, Battery to 14th st., 3 distributing ducts, in addition to those now being built. 33d street to 59th street, 3 distributing ducts.

Third Ave. and Bowery.

7. East side, for same distance as subway now being built on the opposite side of street, 4 distributing ducts on the Bowery and 3 distributing ducts on Third avenue.

Lexington Avenue.

8. Both sides, 21st street to 59th street, 2 distributing ducts.

The urgency for the distributing ducts asked for in the part of the city between 23d street and 59th street is all the greater because there has been built and is now being built in that part of the city an extensive system of Edison distributing ducts for the exclusive use of the Edison Company, giving to that company an advantage in the competition for business in that vicinity not shared by any other company.

Very respectfully,

THE U. S. ILLUMINATING COMPANY,

By C. H. JACKSON, President.

Mayor Grant: Those are all the communications that I have received. If any of the other companies which have received my letter have anything to say in relation to this matter I would be pleased to hear them.

Mr. Foster (representing the Mount Morris Electric Light Co.): I am informed by the President of the Mount Morris Company that he received his letter about half an hour ago, and thus we were not enabled to form any answer in writing to submit to you; but I can state for the Company here that subways of course should be built as speedily as possible, in order to enable the companies to put their wires in them and thereby avoid accident. The Mount Morris Company so far has had no accident. It is so situated as to its business that it has no wires in the subways with the exception of that in 125th street. It has, however, made an application to put wires in the proposed subway in Broadway, from 14th street down to the Battery. Now, where no subways exist the Mount Morris Company would suggest that the law be strictly enforced as to the poles and wires; namely, that the poles be good staunch poles and the wires be properly insulated.

Mayor Grant: Properly insulated—what is that?

Mr. Foster: I refer to the Expert on that.

Mayor Grant: I would like somebody who knows to tell me about that.

Mr. Foster: We have our Engineer here, Mr. Young.

Commissioner Gibbens: I would like to ask Mr. Young a question.

Mayor Grant: Mr. Young, Mr. Gibbens would like to ask you a question.

Commissioner Gibbens: I would like to ask you if the accidents from overhead

wires are due to the impossibility of insulating the currents used or to defective insulation and the overloading of circuits?

Mr. Young: I would say defective insulation and the overloading of circuits.

Mayor Grant: Is there such a thing as the proper insulation of a wire so that it will be safe for the human body to come in contact with it and the wire be practical so that it can be utilized in the distribution of electricity with an alternating current?

Mr. Young: I think such a wire is already in existence.

Mayor Grant: Can you say where it is?

Mr. Young: A number of wires I think would answer the requirements.

Mayor Grant: Have you ever heard of a person willing to touch such a wire?

Mr. Young: I have touched them myself.

Mayor Grant: You have touched them?

Mr. Young: Yes, sir.

Mayor Grant: Well, then, how do these wires kill these people?

Mr. Young: The trouble has been—the wires that caused most of these accidents are not the wires I refer to; they are wires that have been up a number of years; repairs could be made on the wires if the linemen were at liberty to replace wires with good insulated wires, with copper fastenings, and not bring the cross-arms too close together.

Mayor Grant: Where is there one?

Mr. Young: I think the Manhattan Electric Light Company has a good pole line.

Mayor Grant: Has your Company in operation one?

Mr. Young: We have.

Mayor Grant: Where?

Mr. Young: In Greenwich street.

Mayor Grant: Is there any portion of them you will touch without gloves?

Mr. Young: Not all the wires; no, sir.

Mayor Grant: Is there any portion of them?

Mr. Young: Yes, sir.

Mayor Grant: Where?

Mr. Young: I cannot state exact locations; but at different points.

Mayor Grant: I would like to have a definite place where you could touch a wire or have one touched?

Mr. Young: On Greenwich street, south of the station.

Mayor Grant: You say if a wire is properly insulated any person can touch it?

Mr. Young: Yes, sir.

Mayor Grant: The connection of that wire, how is it insulated?

Mr. Young: Insulated with tape.

Mayor Grant: That is as properly insulated as the other?

Mr. Young: No, sir.

Mayor Grant: Is then that wire properly insulated?

Mr. Young: The wire itself could be touched all over; the connection is the hard point to make correct; they make connections every day without gloves; our rules are—

Mayor Grant: We have the unfortunate experience that everybody who has touched one we hear of him in the Coroner's Office; I do not know how they get killed, but they seem to get killed.

Commissioner Gibbens: What is your explanation of their getting killed?

Mr. Young: Some of the occasions have been from defective insulation of wires.

Mayor Grant: Has anybody been killed by the wires of your Company?

Mr. Young: No, sir; I don't say there can't be, but there has not been.

Mayor Grant: I don't know anybody else but you as an electrical expert that says there is a proper system of insulation.

Mr. Young: I say all accidents that have happened—

Mayor Grant: I am saying a proper system—you are the only one I have heard say there is a proper one except persons who are not electrical experts; but certainly I respect your opinion.

Mr. Young: Pole lines and overhead lines can be constructed—

Mayor Grant: I am talking about the wire.

Mr. Young: That is what I mean.

Mayor Grant: Is there any other company that I have written a letter to on the subject that wishes to be heard?

Mr. Speer (Superintendent of the Brush Electric Ill. Co.): Your letter to the Brush Company was received only about 12 o'clock—too late to give a written reply.

Mayor Grant: Can you give any verbal reply?

Mr. Speer: Simply that our wires are in the best possible condition and that we are placing our underground system as rapidly as facilities are afforded by the Subway Company.

Mayor Grant: Are you an electrical expert?

Mr. Speer: No, sir.

Mayor Grant: Who is your expert?

Mr. Speer: Mr. Stevens.

Mayor Grant: Is he here?

Mr. Speer: He is not present.

Mr. Jackson (President of the U. S. Ill. Company): We received your letter this morning. I will say verbally we are thoroughly in accord with the suggestion thrown out to get our overhead wires into better shape and get underground as rapidly as possible—underground is what we are particularly after. And that is the reason I addressed that letter to this Board—that we are wanting to extend our system, and the underground facilities are not going along as rapidly as we would like to have them. That is also the reason that I suggested that we could build some for ourselves if the permission was accorded us. And as to the overhead lines it is pretty difficult to express an opinion here that any insulated wire overhead would be absolutely safe, there are so many circumstances. We can make a good overhead insulated wire when the wire itself per se might be practically safe, but there are so many contingencies in the open air that come to interfere with your wires; for instance, a wire of another company, telephone or telegraph wire or a thousand things during these stormy times we have had in the last fortnight, they cut the best insulation we put on the wires. They then become dangerous elements themselves, and some of the accidents in this city I think were caused by that very cause.

Mayor Grant: Have you any wire in operation as described by Mr. Young?

Mr. Jackson: We have recently put up what is very good insulated wire. We have tested it under water.

Mayor Grant: Would you like to have anybody touch it?

Mr. Jackson: I don't believe I would. Taking samples of that wire as we get it and testing it with the current on under water, it really seems to be very good; but there are so many contingencies that come up in our streets.

Mayor Grant: You would not touch it yourself?

Mr. Jackson: I beg to be excused. But I do want to impress upon you the importance of having some facilities for getting along with our underground work, and I want to say that I don't want to find any fault; but we are underground, perhaps, as anybody in the city; we have fifty miles of cable underground; we are striving to get underground wherever the subways are; we have our cable coming forward for 29th street and 23d street and all other streets. The only trouble is that we don't get along fast enough. I want to call also attention to one remark in that letter which I addressed to the Board, or rather, to you as the Chairman of the Board, as to our distributing facilities. Taking the upper part of Sixth avenue, we have no distributing facilities; we have to come a long distance at a great expense, more expense

than if we built distributing ducts ourselves and reached our customers easily. If this Board would permit us we would build such distributing ducts in those places where they are not now provided.

Mayor Grant: I don't know that this Board has any right to do that.

Mr. Jackson: I make that suggestion.

Mayor Grant: I don't know whether it is right or not; but I certainly don't want to be held responsible for any of these deaths.

Mr. Jackson: Nor I either.

Mayor Grant: I don't know whether this Board has a right to grant you any permit even if it so desires. The Board has a contract with the Construction Company, and I don't know that it has the right to give you a permit if it so desires until such time as that company fails to perform its contract.

Mr. Jackson: I make these suggestions simply to help us out of our difficulties; and if you have the right I want you to understand that we are perfectly willing to go ahead and build these subways and not ask for these subway privileges.

Mayor Grant: You ask, then, for these privileges—have you asked this Subway Company?

Mr. Jackson: Yes; we had quite a long list of wires that we wanted at the last meeting, and we have asked for distributing ducts here and there over the city; they have not yet been accorded us, and there is—

Mayor Grant: I mean, have you asked the Construction Company?

Mr. Jackson: Yes, we have asked the Board; we have not perhaps asked the Construction Company directly. One particular case in that regard is here on Broadway, where they are building a subway now; we ask for a minimum of three distributing ducts on the east side of Broadway—that is as little as our Company can get along with and take down its present line and do the business contemplated there—they offer us one; we ask for three and are ready to occupy them. I have explained that very fully to Mr. Kearny and also to Mr. Beckwith.

Mayor Grant: Col. Kearny says that you can get all you want.

Col. Kearny: I say they ask for three and we are building four.

Mayor Grant: Can they get as much as they want?

Col. Kearny: I imagine if they apply for four they can get four; they don't apply to me, they apply to the Construction Company.

Mayor Grant: He says they apply for three and only have one.

Mr. Jackson: We originally asked for four on the east side of Broadway where they are building the conduit. Now, that application was returned to us, and we were asked to reduce the number. Our Engineers came together, and I repeated the application for three for our Company, and I am put off with one by a letter

under date of September 27th, from Mr. Beckwith, the Engineer, addressed to our Mr. Scoullar, General Superintendent.

Mr. Jackson then read this letter in support of his statement.

Mr. Jackson, continuing: Now, the same thing holds good in some other places. On 42d street—on that also we asked for three ducts, and are accorded one. Well, we cannot possibly get along with our distribution with one duct. We have an arc light system and an incandescent system in that Company.

Mayor Grant: Mr. Jackson, I want to get at this subject first—you believe, do you—do you believe that the only safe way to prevent the numerous deaths that are occurring is to have the wires put underground.

Mr. Jackson: I most certainly do.

Mayor Grant: You don't believe there is a proper system of insulation?

Mr. Jackson: There is a very good insulation; the insulation may be proper, but there are so many contingencies arising that we cannot tell what moment a storm comes and breaks down the line.

Mayor Grant: Then you disagree with Mr. Young that the wires can be touched?

Mr. Jackson: Men have touched wires and lived; but I don't want to.

Mayor Grant: On general principles it is the safe thing not to touch them. There is only one thing—the question of getting these wires underground. Now, you say they are not building them as fast as you can put them underground. Col. Kearny has something to say to you in that regard.

Col. Kearny: Mr. Jackson represents the United States Company, and has only been connected with it since the 1st of this year. Previous to that time I had written to the United States Company certainly half a dozen letters, telling them in each case—the United States as well as other companies—telling them in each case when we expected building a subway that we were going to construct them, and asking them what accommodation they would require, their preference as to the construction. In only one case have they even answered my letter. About that time the President said he did not believe in underground work, the problem had not been solved, and he did not care to ask any questions. Now, Mr. Jackson comes here and complains that we have built these subways and that they are not sufficient for his business. In relation to Broadway, Mr. Jackson's is the only company that sent an answer to my letter; Mr. Jackson's Company did reply they wanted four ducts; we put four there; I do not believe it will be in the near future when he will want them; Mr. Beckwith can tell him why he has not been allowed two or three ducts.

Mr. Jackson: If I can have four, or at least three, the moment they are ready for occupancy I will be in them.

Mayor Grant: I understand Mr. Forster to say he wants some there?

Mr. May (Pres. Mount Morris Elec. L. Co.): We have two of them from 14th street to Bowling Green.

Col. Kearny: I am quite sure Mr. May's Company never answered my letter.

Mr. May: I never had your letter.

Col. Kearny: We are going to build on the other side of Broadway, and we may accommodate the United States Company there.

Mayor Grant: I do not know what the Subway Company have to say about it. Mr. Lauterbach, the President of the——

Commissioner Gibbens: Mr. Chairman, I think I want to ask Mr. Jackson some questions about these overhead wires. I think we had better leave the question of the subways until we get over the question of the overhead wires.

Mayor Grant: The only question with me——

Commissioner Gibbens: We have had one electrical expert who told us that overhead wires could be constructed which would be safe; that there was insulation for these overhead wires which would render them safe; perhaps not as safe as underground, but, at any rate, safe.

Mayor Grant: I want to say here——

Commissioner Gibbens: We have the evidence of this one expert.

Mayor Grant: That has not convinced me.

Commissioner Gibbens: Mr. Jackson, representing the United States Company, and being an applicant before this Board for overhead wires to the extent of some 300 miles, and at the same time being in receipt from day to day of permits to make lamp connections from the Expert of the Board, under the regulations passed at the last meeting, comes here and says he does not think that these overhead wires can be made safe, or, at least, so I understood him, and I want to say right here that if I believed as he does, or as I have understood him to say, I should from this time deem it my duty not only to refuse to grant any more overhead wires, not only to refuse any more lamp connections, but also, in virtue of the authority which is vested in this Board by law, to pass or offer a resolution to the effect that hereafter no circuits should be run over overhead wires in the City of New York.

Mayor Grant: Do you feel like offering such a resolution? I am prepared to vote on it.

Commissioner Gibbens: If I believed as Mr. Jackson does that these overhead wires cannot be made safe, I would be in favor of that; and in order that my impression about the thing may be either strengthened or prevented I would like to ask Mr. Jackson this question. I will ask it so that we may have his answer on the minutes. Are accidents from overhead wires due to the impossibility of insulating the currents used or to defective insulation and the overloading of circuits?

Mr. Jackson: To answer that I would say this: That doubtless some of the accidents that have taken place in this city have been due to defective insulation; I do not know overloading circuits—I do not know that any of them have been caused by that—not that I know of at least.

Commissioner Gibbens: But I wish you to answer my question as I put it. I want to know if these accidents for which the Board of Electrical Control has been presented by a Coroner's Jury are due to the impossibility of insulating the currents used or to the defective insulation and the overloading of circuits.

Mr. Jackson: It is like this, Mr. Gibbens—

Commissioner Gibbens: Which is it?

Mr. Jackson: There is a possibility, perhaps, of making an insulated wire when new practically safe; but how long do you think—how long will it be before that wire may become—

Commissioner Gibbens: Now you are asking me a question. I want to know whether these accidents are due—whether you cannot put overhead wires in proper condition.

Mr. Jackson: The overhead wires to-day are not in proper condition. One or two of these accidents have been called to my attention—

Commissioner Gibbens: Are you going to answer my question, or shall we stop? I don't ask you to answer yes or no. Which of these propositions is correct?

Mr. Jackson: You can make wires very safe by overhead insulation; you cannot get absolute safety from them; you cannot tell what moment a storm comes and blows them down; then you have your contact just as bad as ever; the most of the accidents, or several of them, have occurred from that very cause.

Commissioner Gibbens: You can tell those things, but you cannot tell an answer to the question.

Commissioner Gibbens: I would like to ask Mr. Wheeler, who is the official expert of the Board, to answer this question: Are accidents from overhead wires due to the impossibility of insulating currents used or to defective insulation and the overloading of circuits?

Mr. Wheeler: They are due to defective insulation.

Commissioner Gibbens: In your opinion, Mr. Wheeler, if the rules and regulations which are contained on the back of each permit were enforced, were carried out by the electrical companies in the City of New York, would these accidents have occurred?

Mr. Wheeler: Not if they are carried out to the letter.

Mayor Grant: I want to ask you a question: Do not you feel that you have some responsibility for the deaths of these people?

Mr. Wheeler: I have urged action to have these wires improved repeatedly.

Mayor Grant: If you order wires of that character, and these companies are not using them, I believe you put yourself in the position that the presentation of the Coroner's Jury is somewhat just.

Mr. Wheeler: It is only a week ago I urged the sending of letters to the companies to change their wires, and it was decided best to leave that letter to this meeting.

Mayor Grant: I never heard such a statement until Mr. Gibbens told me that there was such a claim that there was a proper system of insulation to be used and not used, and you have never made such a statement to me.

Mr. Wheeler: I not only made that, but I made that rule; I made a rule that Underwriters' wire should not be used under any circumstances.

Commissioner Gibbens: Mr. Chairman, the Board of Electrical Control, acting in accordance with law, has not only proceeded to build subways and compel their occupancy by the electrical companies, but also to regulate the use of overhead wires pending the building of those subways. The rules and regulations of the overhead wires for electric light are contained on the back of every permit. Those are the rules and regulations of the Board of Electrical Control. Now, there is this much—

Mayor Grant: After writing such a rule he let those wires remain up.

Commissioner Gibbens: There is this much responsibility on the Board of Electrical Control—to make these regulations for the electrical companies in the City of New York in the use of the overhead wires until they can get them underground and to the best of the ability of the Board to see that those regulations are enforced. Now, then, the Board made these regulations several years ago, and has used every effort to have them enforced. We have a corps of inspectors whose duty it is to report violations of these rules and regulations, and on the return of that report we notify the companies, whereupon they send back word that they have remedied the defect, or we proceed to further measures. All that has been done, and yet the number of violation of the rules and regulations is so great that, with the force at the disposal of the Board, it is not able to cope with them, and the result, these accidents you find. And I say here, in support of Mr. Wheeler's opinion, that it is my opinion that if these rules and regulations could be carried out these accidents would not occur. What is the duty of the Board of Electrical Control in such a state of things? While we have been using every effort to have these rules and regulations carried out in the past, at the same time let us make more effort; let us use greater efforts; let us insist upon it that these companies not only understand these rules and regulations as they have in the past, not only are bound by the acceptance of their permits to carry out these rules and regulations, but let us see to it that they do it. They are here assembled now. Some of them have wires which are properly insulated; but most of the wires in the City of New York are not. That is the situation. It seems to me that it is our duty

at the present time to call upon these companies for a test, an accurate test of their overhead wires in the city, and a showing from them that those wires conform to these rules and regulations.

Mayor Grant: If there is such a system?

Commissioner Gibbens: There is a system. Our official adviser states that carrying out these rules and regulations means no accidents.

Mayor Grant: And if our official adviser says that he allows wires to remain up that he deems—he knew were not properly insulated, and there was a proper system of insulation that could have been placed upon those wires, I am frank to say that I rather agree with the presentation of the Coroner's Jury.

Commissioner Gibbens: Mr. Wheeler's position is this: He has done everything in the world that can be done, and the Board has done also.

Mayor Grant: Before I would have taken such a position I would advise that the entire electric light system of this city stop.

John J. Moore (of East River Electric Light Company): The East River Electric Light Company thinks its wires are well insulated. We know the requirements of the Board; our daily tests show it; we don't have any trouble. There are two classes of wires in this city—old wires and new wires; the new wires are good wires, the best known in the business; the old wires are the poorest; they become old with age; in our business we call them undertakers' wires; they were named undertakers' wires, the fatality is so great. Our men are touching our wires daily, and there is no trouble.

Mayor Grant: I believe every one of those wires ought to be taken down right away.

Commissioner Gibbens: I would like to ask you, with the permission of the Board, to answer this question which I have put to others: Are the accidents from overhead wires due to the impossibility of insulating the currents used or to defective insulation and the overloading of circuits?

Mr. Moore: To defective insulation.

Mayor Grant: Is there a proper system of insulation?

Mr. Moore: There is, that can be touched in operation.

Mayor Grant: I move that this Board instruct the Electrical Expert to have removed immediately all overhead wires that, under his statement here, are not properly insulated.

(Not adopted. See substitute.)

Mayor Grant: In connection with that I propose to say that if I embarrass those companies in any way at the next meeting of the Board I will consider a proposition

to give them subways, if it is in the power of this Board, as far as my vote is concerned. If there are such wires in existence, I don't propose as far as my vote is concerned to allow them to exist.

Commissioner Gibbens: Mr. Chairman, I desire to suggest in connection with that motion that, after you have ordered the Electrical Expert to order the removal of these wires which are improperly insulated, that you also state that he shall have them replaced by properly insulated wires and of proper dimensions.

Mayor Grant: I propose to do this: He says there are wires up that are improperly insulated—I don't propose to give any wires under this system at all. If the companies will apply and show good cause for putting a proper system of subways down, and this Board can do it, I think the time has come when we cannot stand in the way of putting these wires underground or prevent anybody from putting them underground that wants to. I propose, under the statement and advice of the Electrical Expert of this Board, to do something that is affirmative.

Commissioner Gibbens: What are you going to do about these wires while these subways are being built?

Mayor Grant: Rather than have a death occur from one of those wires, knowing that I was responsible for it, I would not care if all the electric lights in the city stopped. When it comes to the question of these electric light wires that are of such character, and the Expert of this Board advises me they can be remedied, and they have not been remedied—

Commissioner Gibbens: The question is, Has this Board done everything possible by pointing out the violations of these rules and regulations by urging on these companies the substitution of proper wires and proper insulation for those already up or not? I say it has; and I say furthermore we ought to proceed in that direction. If these companies are to go to work in good faith to remedy the wires which are overhead to-day they will want to put up in the place of these wires overhead wires that are properly insulated.

Mayor Grant: I believe in their going underground.

Commissioner Gibbens: In justice to electric lighting interests I would like to state that during the year 1888 there were 1,258 accidental deaths in this city; 4 of them were caused by suffocation, eating food, etc., 32 by illuminating gas and 5 by electric light wires. The electric light business is not so dangerous.

Mayor Grant: Then the increase this year has been considerable. Just read that (handing Com. Gibbens a paper).

Edward Lauterbach (President of the Consolidated Tel. and Elec'l Co.): The Consolidated Company received this morning an invitation that was extended to the various companies to be present before the Board. It may be well for a few moments to review very briefly what has gone before in respect to the Company and what it is doing now and the situation it has maintained. Those who are entirely familiar with

the early history of this matter will know that when the work of the Subway Company in conjunction with the Consolidated Telegraph and Electrical Subway Company was first initiated it was to meet the hostility of every existing telegraph, telephone, electric light and other company in the city of New York; and at the outset of its career it not only had no prospect for any tenancy, but the prospect, which in many instances has been more than realized, of litigation of the most bitter and obstinate character in respect to all that it attempted to do. That was almost without exception the case, except that it may be said very early in the history of the Company the Telephone people recognized the propriety of going underground. The Edison Company had always had that reputation, and in fact it has never had any wires strung in the city of New York; its original system was an underground one, and it met the efforts of the Board and of the Subway Company with co-operation because its peculiar system forbade the use of overhead wires. It is fair to say that at certain periods the Western Union Telegraph Company and the Metropolitan Telephone and Telegraph Company were in accord. The Manhattan Electric Light Company at an early stage of its career went into the subways. The other companies—the East River Company has not yet become a tenant of the subways, nor, I think, the Mount Morris, although, as I understand it, the desire exists; the United States and Brush companies—the Brush Company, though somewhat tardily, at about the time of the issue of your Honor's famous order, became a tenant of the subways, and the United States Company, at about the same period—very late in the history of this whole enterprise—also signified its intention of going into the subways. It is not surprising that the movement did not go forward in the early history of the Company as rapidly as it should have gone.

Mr. Lauterbach continued at great length, giving many facts and figures in relation to the subway construction by his Company and stating the many difficulties it had met with respect to it.

Wheeler H. Peckham stated that he had been requested by the Standard Electrical Subway Company, a Company which had been but recently organized, a proposition of that Company to build subways. He stated that it was now ready to put on the work thousands of men and carry it through to completion just as soon as it possibly can be done, and offered to submit a plan for a comprehensive system of subways for the whole city.

Mr. Lauterbach denied the right of the Board to make a contract with this Company or any other except under certain conditions, which did not exist at that time.

Mayor Grant stated that he would confer with the Corporation Counsel in respect to the Board's power in the matter.

Commissioner Gibbens: Mr. Mayor, I would like to ask your consent that there be added to your motion these words: "and that properly insulated wires, according to the rules and regulations of the Board, be substituted therefor."

(Not accepted. See substitute.)

Mayor Grant: I shall oppose that.

Commissioner Gibbens: The Board has no power to remove wires from the streets where subways have not been built.

Mayor Grant: Where they are not properly insulated?

Commissioner Gibbens: We have the power to regulate; we have the power to compel proper insulation; there is no power vested in this Board to take away the business of these companies except where subways are provided.

Mr. Speer (of Brush Co.): I wish to say in respect to this question of repairing wires that we were obliged to ask for permits, as we have on certain occasions; if we undertook to replace a wire in our opinion defective we would be stopped by the policemen.

Commissioner Moss: You could have a permit in fifteen minutes if you asked for it.

Expert Wheeler stated that he had been calling attention to the defective condition of the wires and urging their improvement, and that some two weeks ago he had drafted a circular letter to the companies in relation to this matter, but had been told to hold the letter to the meeting of the Board.

Commissioner Moss: Read that letter.

Expert Wheeler thereupon read the following letter:

NEW YORK, September 27th, 1889.

To the President of the — Company:

SIR:—It having been reported to us by our inspectors that you are, in many places, violating the rules governing the construction of overhead conductors for electric light and power, you are notified and directed to repair and replace all wires having defective insulation and to replace all wires whose capacity is below the minimum allowable for safe operation with wires of sufficient capacity.

Mayor Grant: I will accept an amendment that the Electrical Expert be instructed to see that all currents are cut off those wires until such time as the next meeting.

The Board, on motion of Commissioner Gibbens, took a recess for an hour.

The Board reassembled at the expiration of the recess hour (4:15 P. M.), all being present except Commissioner Hess, and

Mayor Grant offered as a substitute for the resolution moved by him before the recess the following:

Resolved, That notice be given to all companies operating and furnishing electric lights on overhead wires in the city of New York to discontinue the use of such over-

head wires as are not properly insulated until such time as said wires shall be certified to by the Expert of this Board to be in proper and safe condition.

Unanimously adopted.

Mayor Grant: The Secretary will notify the companies.

Commissioner Gibbens: I am satisfied to have them notified by letter. Now, suppose they come forward to-morrow, after receiving this notice, and desire to put their lines in such condition as will satisfy the Expert—are they not allowed to do it?

Mayor Grant: Not until it comes before this Board. Have a meeting, if you like, to-morrow.

Commissioner Gibbens: Have a meeting to-morrow in order to consider such applications?

Mayor Grant: Yes. There will be a meeting to consider applications to place these wires in proper condition to-morrow, at 11 o'clock.

Commissioner Gibbens: In order that the impression may not go out that the companies have not had notice, I would like to read a circular letter sent to each of these companies on the 5th of July.

The Commissioner thereupon read from the Board's letter-book, as follows:

NEW YORK, July 5th, 1889.

To the President of the — Company:

DEAR SIR:—Certain occurrences of late in the city of New York point distinctly to the fact that the Rules and Regulations of the Board of Electrical Control with regard to overhead electric light circuits are not complied with. There have been instances where accidents have occurred fatal or dangerous to life, which, in view of these Rules and Regulations referred to, are utterly inexcusable. Overhead circuits have been overloaded to such an extent as to be destroyed, and an improper insulation is continued in running overhead lines, notwithstanding that the Rules and Regulations of the Board of Electrical Control directly and positively forbid it.

I take this occasion privately of calling your attention to these violations of the Rules and Regulations of the Board, in order that the matter may not become the subject of public discussion, and in order that I may not be obliged in my capacity of Electrical Expert of the Board to advise the shutting off of all your circuits until such time as they are made safe or, in default of this, the absolute prohibition of high tension currents in the city of New York.

The Board of Electrical Control has so far seen fit to make no radical restriction upon the amount of current which can be carried upon electrical conductors in the city of New York—as has been done in other cities to the great detriment of the electrical service—believing that, with proper insulation and attention, a sufficient factor of safety can be attained whatever the current may be. It is for the electrical companies to see to it that they are not unduly restricted, as result of negligence and false economy, in the construction and care of their lines. Not only is this to your interest as far as any action on the part of the authorities is concerned, but also that you may

relieve yourselves of the odium which attaches to your business in the public mind and prevent the pecuniary and other punishment certain to come upon you whenever you are brought before juries or other judicial tribunals upon whatever charge can possibly be brought against you.

There can be no doubt of the authority of the Board of Electrical Control in the premises to regulate you and your service to any extent that may appear to be necessary for the public safety, as reference to the Act of 1887, Chapter 716, which prohibits the use of any electrical conductors in the city of New York not approved by the Board, will speedily convince any one considering it.

The Rules and Regulations to which I have referred, and which are numbered XXII, XXIII, XXIV and XXV of the Rules and Regulations of the Board of Electrical Control for Overhead Conductors for Electric Light and Power, are sufficiently simple for easy comprehension, and can readily be complied with. If they were so complied with, nothing but gross carelessness or the intervention of Providence could cause serious injury to life or property through the use of high tension currents.

I can confidently state that it is the determined intent of the members of the Board of Electrical Control to reduce the danger from electrical service in the city of New York to the minimum, and unless the electrical companies operating high tension currents manifest great change in disposition with reference to the following out of the Rules and Regulations which have been laid down, harsh measures will be resorted to so that the public safety may be assured.

Hoping that these suggestions will receive your careful consideration, in your own interest, as well as that of the public, and that you will regard them not only in the light of the present, but also as referring to the future of the business of supplying electric light and power in the city of New York, I remain,

Yours very respectfully,

SCHUYLER S. WHEELER, Electrical Expert.

Commissioner Gibbens: Showing that these companies have been notified since July 5th to put these wires in proper condition and have not done so.

Commissioner Gibbens moved the following resolution:

Resolved, That the applications before the Board from the Metropolitan Telephone and Telegraph Company to string wires for individual telephone connection in localities where there are no subways be granted.

Unanimously adopted.

Commissioner Gibbens: Mr. Wheeler wants to call attention to the fact that there is a misprint or typographical error he desires to have amended, as follows: Amend Rule XXII, that is, "1/20" to read "5"; amend Rule XXV, that is, "1/10" to read "30." It seems there was a misprint at the time the Rules were printed, and he wants to make this correction in the minutes. The effect is to make the Rules as they ought to be.

Mayor Grant: Lay it over for the present.

Commissioner Gibbens: There is a report here of the number of poles and wires removed from January, 1889, to September, 1889—2,475 poles, 3,155 miles of wire. The total number of poles and wires removed since the organization of this Board is 3,665 poles and 4,885 miles of wire.

Commissioner Moss moved that the Board adjourn to Thursday, October 10th, 1889, at 11 o'clock A. M.

The motion was unanimously agreed to, and the Board thereupon adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, October 10th, 1889, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Daniel L. Gibbens and Theodore Moss.

The reading of the minutes of the last meeting was dispensed with.

The following communication from Expert Wheeler was read.

NEW YORK, October 10, 1889.

To the Board of Electrical Control:

GENTLEMEN:—With regard to the resolution passed at yesterday's meeting of the Board, to the effect that no overhead wires for electric lighting shall be operated without the certificate of your Electrical Expert to the effect that they are in safe and proper condition, I desire to make the following statement:

It is absolutely true, as stated by me yesterday, that the accidents which have occurred from overhead electric light wires are due to defective insulation and the overloading of circuits, and that the improper and unsafe condition of these overhead wires can be remedied by an adherence to the rules and regulations of the Board of Electrical Control.

It is also the fact that during the time since these rules and regulations have been in force and I have been connected with the Board of Electrical Control the condition of the wires has been improved, and the chances of accident are much less in proportion to the amount of business done by the electrical companies than at any time in my recollection. As an evidence of the work which has been done in this direction by the Board I call attention to the notices of violations of the rules and regulations which have been sent out since these rules and regulations have been in force. The number has been 2,332. Of this number of notices 580 have been attended to by the companies to which the notices were sent; and the sending of these notices is continuous and takes place as fast as the violations are ascertained by the three inspectors now employed by the Board.

In order to secure a safe and proper overhead conductor for electric lighting purposes, it is necessary to have:

First: Proper insulation, which must be renewed whenever it becomes impaired.

Second: Proper conductivity, which means that the amount of copper in the wire must be proportionate to the current to be passed over.

Third: Proper construction, which means that every pole and pin and insulator must be safe and secure, so that the wire cannot be blown down or torn down, but will maintain its position despite the circumstances to which it is subject.

Fourth: A proper arrangement of the wires, which means that all broken and dead wires of whatever kind must be removed, and the electric lighting wires must be out of the way of anything which can come in contact with them and abraid their insulation or tear them from their fastenings.

Fifth: A proper designation of the wires, so that the lineman can tell which are day and which are night circuits.

All these matters, except the last, have been provided for by the rules and regulations; but, in order to ascertain definitely whether each and every one of these precautions and the others laid down by the rules and regulations are enforced, one must observe and actually inspect closely every inch of overhead wire in the City of New York, amounting to a thousand miles in all; and to do this would require a large force of competent and trustworthy men experienced in the construction of electrical conductors and who could be relied upon for authentic reports of their condition. Moreover, after the task had been once completed, it would be necessary to make further inspections from time to time, and unless the force of men engaged in the work was large enough the time for the second inspection would come before the first was completed.

The Board will therefore appreciate the fact that no certification will be given by me as to the condition of the electric light wires until such time as the Board shall see fit to provide me with this force of workmen and until I shall have had sufficient opportunity to examine the conductors, inch by inch, and be assured of their condition; nor will it be possible to certify to any of the wires if the present policy of the Board, as outlined yesterday, preventing the making of improvements by the electrical companies themselves is adhered to.

It may be said in conclusion that the business of electric lighting is a dangerous business much as the business of railroading, supplying gas for illuminating purposes, trucking, manufacture of chemicals, gunpowder, etc. In the conduct of a dangerous business it is not possible to secure absolute safety except by refraining from that kind of business. The greatest amount of safety is all that is demanded of those who carry on trades or occupations essentially dangerous to life in their nature. The wires will undoubtedly be safer underground than they can be made overhead, and yet they will still be dangerous. They can be made infinitely safer overhead than they are at present, and still they will be dangerous. It is for the Board to determine whether it will and can destroy

the business of electric lighting or so confine it to currents which are not dangerous to life, as has been done in other cities, or allow and insist upon all the advantages in the system which may be additional safeguards until subways have been provided and the wires can be placed underground. As to this, I do not attempt to advise the Board, nor do I desire to express an opinion as to the powers and duties of which the members are the best judges. I may say, however, as a scientific man that in the case of all dangerous businesses the methods which have been suggested for their improvement, to render them safe, are not generally adopted. For instance, if a railroad train runs over a man at a crossing, the general method of procedure is to compel the railroad company to adopt a signal for crossings in place of tearing up the rails on which the railroad does its business. Again, if a horse car runs over a man who falls upon the track, as the Italian fell upon the uninsulated electric light wire which killed him, it is not the custom of the authorities to tear up the rails of the horse car company, but it is a general rule to pass an ordinance to the effect that the cars shall not run at more than a certain rate of speed and shall take such other precautions as will make their business as safe as possible.

All of which is very respectfully submitted.

SCHUYLER S. WHEELER,

Electrical Expert to the Board of Electrical Control.

Mayor Grant asked Expert Wheeler many questions bearing upon the subject matter of his communication to the Board.

Mr. Wheeler: You can test a wire from the station to see if it is insulated, but you cannot test it to see if it is covered with insulation, which protects a man from injury from it.

Mayor Grant: You know perfectly well my standpoint—coming in contact with the human body.

Mr. Wheeler: From that standpoint, you must inspect the wire.

Mayor Grant: From that standpoint, you said you could test them from the station.

Mr. Leslie (Gen. Man. Manhattan Electric Light Co.): The Manhattan Company claims that its wires are perfectly well insulated and there is no danger of coming in contact with them; and we would like to know whether the Manhattan Company stands in danger of being stopped to-night.

Mr. Wheeler: My opinion is that the wires of the Manhattan Company are in good order; as a matter of certifying that they are in good order, I will not certify.

Mr. Leslie: In that case we will have to stop to-night.

Mayor Grant stated that the matter was entirely within the province of the Expert under the resolution which had been passed the day before, and suggested the reading of the resolution for the information of Mr. Leslie.

Mr. Leslie: I am familiar with that resolution, but I am not familiar with the probable action of the Expert. I make that assertion again, that our wires are thoroughly well insulated, they are new and safe, and if we are stopped in the conduct of our business because of that resolution you will have done an irreparable damage and injury and done us a great injustice.

Mayor Grant: If there is an injustice done you in that way, Mr. Leslie, all I can say is that you have your remedy. I am only doing what I assume to be my duty, and I have no apologies to make for what I am doing; and I have the same conviction I had yesterday that if there is a proper system of insulation this Board must have it in use, and no other; and if our Expert advises us that there are wires in existence that are not properly insulated, and there is a system of proper insulation that the human body can come in contact with, we must have it.

Mr. Speer, of the Brush Company, requested the reading of the following letter:

NEW YORK, October 10th, 1889.

HON. HUGH J. GRANT, Chairman Board of Electrical Control, 1266 Broadway, New York City:

SIR:—Your favor of the 8th inst., calling our attention to casualties from electric wires, and stating the subject would be considered at the meeting of your Board to-day, was received too late for acknowledgment.

In reply we would state that this Company has had but three casualties during the present year, only one of which could possibly be due from overhead lines.

The only death (Edward Quinn) occurred in our dynamo room, of which he had charge, and was the expert making all rules for the government of himself and others.

The case of James Powers, incorrectly cited by newspapers and the Coroner as being killed by electrical current, was simply one of falling from a sixteen foot ladder while engaged in examining the condition of a lamp. Of course all lamps must, to be useful, be above ground whether supplied by overhead or underground currents. We are happy to state that Mr. Powers is rapidly recovering from the effects of his fall.

The last case, that of Patrick Driscoll, was also that of a fall, in this instance out of a tree, and was probably caused by shock from current. It was undoubtedly a clear case of carelessness, as he was instructed to repair a break and neglected to use his gloves although urged to at the time; he is now convalescent.

All of these cases were our own employes, and no citizen has been injured by our lines.

This Company is and always has been desirous of keeping its circuits in perfect condition, as directed by Rules 12 and 25, and repairing its lines whenever necessary by renewing any wires showing imperfect insulation, but under the present rigid rules we have no general permit allowing us to do so.

In accordance with your request to make a suggestion for the consideration of your Board, we would suggest the propriety of not only requiring but authorizing each and every company to place the circuits in perfect order wherever and whenever imperfections may occur.

Respectfully yours,

BRUSH ELECTRIC ILLUMINATING CO.,

W. T. MOORE, President.

The Board questioned Mr. Speer in respect to the statements contained in the communication of the Brush Company and other matters connected with the resolution of the day before directing the companies to cease the operation of their imperfectly insulated overhead wires.

The following communication from the United States Illuminating Company was read:

NEW YORK, October 10th, 1889.

HON. HUGH J. GRANT, Mayor, and Chairman of the Board of Electrical Control, New York City:

DEAR SIR:—The action taken by your Honorable Board yesterday regarding overhead circuits has prompted us to address to you this communication. In doing so, we do not wish to convey the impression that we desire to unduly extend our overhead system, or that we are unwilling to make the overhead wires now in use as safe as possible, regardless of expense. Indeed, for some weeks we have been at great expense replacing the old wires upon our circuits by new ones highly insulated.

I. We wish to respectfully request that your Honorable Board allow us a reasonable time in which to replace by new highly insulated wires all wires now in use upon our circuits which in the opinion of your Expert are not properly insulated. We will guarantee to carry out his directions in this regard with the utmost promptness, and leave it for him or your Honorable Board to decide whether or not we in fact do so.

II. While we still adhere to the position taken by our President yesterday that, in a city like New York, overhead wires cannot insure absolute safety, we wish again to state it to be our belief that our circuits can be placed in such condition so that the danger will be reduced to a minimum; and, in this connection, we would call attention to the fact that, since the present management have obtained control of the Company, but a single death has been caused by overhead wires, and that under unusual circumstances which probably will never be repeated again.

III. In view of your Honor's opinion that absolute safety can only be secured by burying the wires, and our own desire to extend the underground system, we earnestly repeat our request made at the last meeting for leave to immediately build, at our own expense, such subways as are of immediate necessity for our business. It seems to us that the position which your Honorable Board

has taken with reference to overhead circuits makes it a matter of absolute right that we should be given facilities for a more rapid extension underground.

Very respectfully,

THE UNITED STATES ILL'G CO.,

C. H. JACKSON, Pres't.

Mr. Forster, representing the Mount Morris Electric Light Company, stated that the Company's wires were comparatively new, the insulation was as good as was made, and that it had never had any accidents.

A representative of the East River Electric Light Company stated that its wires were in good condition.

The Board, on motion of Commissioner Gibbens, adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Saturday, October 12th, 1889, at 11 o'clock, A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

The reading of the minutes of the last meeting was dispensed with.

Mayor Grant: I have a report from Mr. Wheeler which I have just received. Is this the report you wish to present now? Do you wish to make any amendment?

Expert Wheeler: No, sir.

Mr. Wheeler's report, as follows, was thereupon read:

NEW YORK, October 11th, 1889.

To HON. HUGH J. GRANT, Mayor, and President of the Board of Electrical Control:

SIR:—With relation to the notice served by the Board upon the electric lighting companies I have to report as follows:

As I stated at the meeting of the Board yesterday, I am unable without a larger force than that at my disposal at present to say which of the wires used for electric lighting is in proper condition.

On the other hand, I am able to inform you that, notwithstanding the notice of the Board, two electrical companies have operated since the receipt of that notice wires known to me to be imperfectly insulated.

These companies are the Brush and the United States Companies.

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Their stations are situated at the following places: Brush, 210 Elizabeth street; United States, 206 Fulton street, 36 Stanton street, and 416 East 29th street, near First avenue.

The enclosed memoranda shows that certain of the wires specified therein are imperfectly insulated and constructed contrary to the Rules and Regulations of the Board.

I am unable to state definitely with regard to the other wires of these and other companies, whether such as are improperly insulated have been operated or not, not having had time to make an inspection.

Very respectfully,

SCHUYLER S. WHEELER,

Electrical Expert to the Board.

"MEMORANDA."

I examined wires supplying lighted lamps on the Bowery last night, and saw that some of them were wires of the United States Ill. Co. in disorderly and dangerous condition, with bare spots visible from the sidewalk in front of No. 306 and 260 Bowery.

S. S. WHEELER.

NEW YORK, Oct. 12th, 1889.

S. S. WHEELER, Esq., E. E.:

DEAR SIR:—I report as follows the condition of the Brush Co. from 8th st. and 3d to Houston st. on the west side in the Bowery:

At Cooper Institute there is a large bare spot about two inches in length at the junction of Third avenue where the wires cross from Third avenue and the Bowery, the wires in that section are very bad, the insulation very bad and about one half dozen bare connections.

Then along the Bowery, under the Elevated R. R., on the street side there are about ten wires of which the bare spots show from a half to an inch in length, caused by the tie wire, and which the linemen in all cases should have covered with tape.

Respectfully,

GEORGE W. ROTH, Ins.

Mayor Grant: Mr. Wheeler, I want to ask you a question in connection with that. You say you found of the two companies you designate no particular wires?

Mr. Wheeler: The memoranda was omitted from the letter. There is the memoranda.

Mayor Grant: Do you believe that those two companies are the only two companies that are operating wires that are not properly insulated?

Mr. Wheeler: I don't believe they are the only ones; no, sir; but I believe they have nineteen-twentieths of such wires.

Mayor Grant: I propose to give an order to the Commissioner of Public Works now, that all wires—not designating any two particular companies—that are improperly insulated be cut.

Commissioner Hess: That is the only way to do it.

Mayor Grant: Now, I don't care for your specifying any particular companies; go and take them all together; I think they could naturally get some relief if we designate any two particular companies; and I now offer this resolution:

Resolved, That the Engineer of this Board be prepared on Monday to have a comprehensive system of subways for electric lighting, to an extent that it will cover as much of the city as possible, to present to this Board.

Unanimously adopted.

Mayor Grant (to Secretary Crain): Mr. Crain, will you please draft the order, an order to cut such wires as have been operated in violation of the rules of this Board and law that are not properly insulated; but you will date the order as of this time—before 12 o'clock.

Commissioner Gilroy: Will the Board of Electrical Control designate to the Department of Public Works how it is going to ascertain which wires to cut?

Mayor Grant: The Expert of the Board will designate it. We don't expect you to be an electrical expert, but Mr. Wheeler is. I wish to call your attention to this: that I would not like to see this order applied to any particular company or companies—that it be indiscriminate; that no favoritism be shown.

Commissioner Gilroy: So far as the Department of Public Works is concerned there will not be any favoritism shown.

Corporation Counsel Clark: I presume the Board will approve that order.

Commissioner Moss: We had better pass a resolution.

Mayor Grant: I do not suppose the Board has the power to give such an order; I suppose the law gives to me the power. I do not suppose the Board will disapprove of my giving the order.

Commissioner Gibbens: The only theory on which these wires can be taken down because they violate the rules and regulations of the Board is that they are encumbrances on the street.

Commissioner Moss: We request the Mayor to have them taken down.

Mayor Grant: The Board seems to be unanimous in endorsement of my action. The Electrical Expert complains that he has not got a sufficient number

of men in his employ. What are the powers of this Board in relation to the employment of assistants for him?

Mr. Wheeler: I started out this morning and employed a man on my own responsibility.

Commissioner Gibbens: Ordinarily when we employ anybody, it has to go through the State Civil Service, but as a matter of necessity in a case of extraordinary emergency we can employ men temporarily. I move:

Resolved That the Expert of the Board be directed to employ a sufficient number of men to assist him in the inspection of the insulation of the electric light wires, so that he may report them to the Commissioner of Public Works, under the order of the Mayor, for their removal.

Unanimously adopted.

Commissioner Gibbens offered the following resolution:

Resolved, That the Mayor be requested to ask the Department of Public Works to see that the rules and regulations of this Board are enforced.

Unanimously adopted.

Mr. Wheeler: In cutting these wires it will be very dangerous because there may be day circuits on. It seems to me some notice ought to be served on the companies requiring them to take the current off.

Mayor Grant: Of course you will notify the companies.

Commissioner Gilroy: Who is in the habit of notifying the companies?

Commissioner Gibbens: Those in charge of the work.

Commissioner Moss: Mr. Wheeler will have charge of the work.

Commissioner Gilroy: I would like to ask you, Mr. Wheeler, if you are ready to go on this afternoon?

Mr. Wheeler: I am ready to go on now.

Commissioner Gilroy: Will Mr. Wheeler go over to my office?

Mr. Wheeler: Yes, sir.

Commissioner Gilroy: Will it be legal to do the work after 12 o'clock to-day?

Mayor Grant: You got your order before 12 o'clock.

Several (in concert): Oh, yes.

Expert Wheeler (reporting on accident at Chambers and Centre streets): I went right up, and I looked at the wires on the poles, and I went to the station of the Power Company that has two wires on the poles to see if its current could

be strong enough; I also went to the Coroner's office; the Coroner had gone away and taken the wire with him; a great many of the wires have been cut down off the poles by repair men; I found a loop of the United States Company's circuit within half a stretch of this pole; that is to say, reaching to a point half way between this pole and the next pole of this system which could possibly have come in contact; I also found two power wires on the pole itself; I went up to the Power Company's station, and I found these wires were being supplied apparently by an Edison dynamo, which as ordinarily constructed will not generate a current sufficient to kill a man.

Mayor Grant: How did these wires get there?

Mr. Wheeler: I don't know; they have been there a long time.

Mayor Grant: Was there any permit of the Board given for those wires?

Mr. Wheeler: I don't know.

Mayor Grant: Do you say there was not sufficient power on those wires to kill a man?

Mr. Wheeler: I don't say that; I do say this, to answer that question: I went up and looked at the dynamo which was in the building——

Mayor Grant: Have you the slightest doubt as an expert that there was sufficient power in those power wires to kill a man?

Mr. Wheeler: Yes, I have doubt, because if it is an Edison dynamo supplying them it would not kill a man.

Mayor Grant: Don't you know that a telephone man's test box was burned out by that same wire only a day or two ago?

Mr. Wheeler: No, I don't know anything about that.

Mayor Grant: It was in the papers this morning. Was there not a telephone test-box burnt out a day or two before?

Commissioner Moss: I read it in the papers.

Mr. Wheeler: I have been very much occupied with these other matters.

Mayor Grant: Don't you think that was an important matter?

Mr. Wheeler: I went out and attended to it.

Mayor Grant: You have not discovered how that power got in that wire?

Mr. Wheeler: I don't know it got in that wire. Those wires were cut down by order of the Coroner, and he had taken them away.

Mayor Grant: I shall expect you to make some sort of a report on this subject next Monday. I do not think such a report as you now make is at all satisfactory.

Mr. Wheeler: I don't either.

Commissioner Hess: How far below the wire which this man was operating on were these power wires?

Mr. Wheeler: I should say about five or six feet.

Commissioner Hess: Only five or six feet?

Mayor Grant: From the man?

Mr. Wheeler: Yes.

Mayor Grant: The man was actually operating in the vicinity of that power wire, was he not?

Mr. Wheeler: He was operating five or six feet above it, but the wire could have sagged down far enough to reach that power wire.

Mayor Grant: Was there ever a permit given for that power wire?

Mr. Wheeler: I don't know.

Mayor Grant: Do you think it is advisable to look that up?

Mr. Wheeler: The system of permits has been in existence only two or three years.

Mayor Grant: Did you ever understand there was a power wire on that line?

Mr. Wheeler: I understood there was a power wire in Centre street; no, sir.

Mayor Grant: Did you understand that line was exclusively for telephone and telegraph business?

Mr. Wheeler: No, sir; I did not.

Mayor Grant: Not even yesterday afternoon?

Mr. Wheeler: Well, I don't know that any pole line is exclusively for one kind of wires, because other wires are put on them promiscuously; that is a thing I have been fighting against for a year.

The Board hereupon adjourned until Monday, October 14th, 1889, at 11 o'clock A. M.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Monday, October 14th, 1889, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read.

Commissioner Gibbens offered the following resolution:

Resolved, That the minutes of the last meeting of the Board be corrected by striking therefrom all matter except that which embraces the action of the Board.

Unanimously adopted.

The minutes, thus amended, were approved.

Mayor Grant laid before the Board a copy of Summons and Complaint, Injunction Order and Undertaking on Injunction, in action in Supreme Court; and

Commissioner Moss, in reference thereto, moved this resolution:

Resolved, That the papers in the suit of the Electric Power Company against the Mayor et al. be sent to the Corporation Counsel.

Unanimously adopted.

The following communication was read:

NEW YORK, October 14th, 1889.

HON. HUGH J. GRANT, Mayor, and Chairman of the Board of Electrical Control:

DEAR SIR:—We have several times called the attention of your Honorable Board and the Consolidated Telegraph and Electrical Subway Company to our need for subways in the vicinity of our large station now almost completed at 24th street and North River. Our need for rather extensive subway accommodations is imperative, owing to the fact that it has always been our intention to distribute our current exclusively by means of underground cables, and we therefore have no lines of poles and wires. The subway on 23d street, between Fifth and Eleventh avenues, was ordered over a year ago at our special instance. It was begun over two months ago; the work upon it has progressed very slowly, but we have reason to hope that it will reach the neighborhood of our station by winter. This fact renders it specially important that we should be provided, as soon as possible, with distributing subways tributary to that main line.

We therefore request to have ordered, and we hereby offer to build the following subways tributary to the 23d street main subway:

Tenth avenue, distributing ducts on both sides, from Little West 12th street to 59th street.

Ninth avenue, distributing ducts on both sides, from Little West 12th street to 59th street.

Eighth avenue, distributing ducts on both sides, from Abingdon square to 59th street.

Seventh avenue, distributing ducts on both sides, from Greenwich avenue to 59th street.

Sixth avenue, distributing ducts on both sides, from Carmine street to 59th street.

23d street, distributing ducts on north side, from Eleventh avenue to Fifth avenue.

In view of the fact that the 23d street subway does not extend beyond Eleventh avenue, we need a subsidiary subway of numerous ducts, beginning at our station on 24th street, near North River, extending up 24th street to Tenth avenue, then going down Tenth avenue to 23d street. The reason why we desire to reach 23d street via Tenth avenue is that we desire to have eventually, and for that matter as soon as possible, a main subway extending up and down Tenth avenue.

We have also completed a new station on Washington street, near Cortlandt. To connect this with the subway now being built down Broadway, we desire a main subway of many ducts from our station north on Washington street to either Dey or Fulton street, then up either Dey or Fulton street, as the case may be, east to Broadway.

The above are only a portion of the subways we need. We merely give those which are of immediate and urgent necessity.

We are anxious and willing to build all these subways ourselves, at our own expense, and, if the Board so wishes, we will add to the ducts needed for our own use as many others as the Board deems necessary in that part of the city for the accommodation of other companies. In such a case we would be willing to enter into a contract with your Board for the building of such subways similar to the contract under which the Consolidated Telegraph and Electrical Subway Company is now operated. If authorized to do the work, we would agree to prosecute it with the utmost vigor, employ as many men as the work will justify, and carry out all the directions of your Board with reference to the character of the work.

We should add, inasmuch as we plan to fill the ducts built for our use with very expensive cables, it is important for the protection of these cables, and to insure satisfactory service to the public, that the ducts be of the most approved construction, and for this reason we request that all ducts to be built or occupied by us be ordered to be of cement lined iron pipe laid in hydraulic cement, as we regard this form of construction superior to all others.

Very respectfully,

THE SAFETY ELECTRIC LIGHT & POWER COMPANY,

By C. V. JACKSON, President.

Commissioner Hess: I move that the communication of the Safety Electric Light and Power Company be referred to the Engineer.

Commissioner Gibbens: I move that it be spread on the minutes.

Mayor Grant: Lay it on the table for the present.

The following communication from the Brush Electric Illuminating Company was read:

NEW YORK, October 14th, 1889.

HON. HUGH J. GRANT, Mayor, and Chairman of the Board of Electrical Control:

DEAR SIR:—We feel that the recent turn of affairs has resulted in a great injustice to us, in that a great effort is being made to compel us to abandon, as soon as possible, the use of our overhead wires, without at the same time being provided with subways to receive our conductors. Our experience with the company who has heretofore had a monopoly of building subways has been unsatisfactory. The work of building subways has progressed very slowly, and but a small portion of the city has been provided with them. The work has been unsatisfactory, and where subways have been built they have been unsatisfactory, owing to the lack of regard for the interest and convenience of the electric light companies who are to occupy them, and in many instances to the fact that not enough ducts were provided for the business in certain localities.

In view of these circumstances, we wish to co-operate with the Board of Electrical Control in its effort to free the city of overhead wires, and at the same time protect our business by building at our own expense subways for our own use, and we will begin the work at once in those portions of the city where our wires are most abundant. In order that your general plan of subways may not be interfered with, we will adapt our requirements to such general plan, and will, in addition to those ducts which we need for our own use, build as many other ducts for the use of other companies as in the opinion of your Board are necessary in the locality where we may be allowed to work. If our suggestion meets with your approval, we would be glad to enter into a contract for the building of such subways, similar to that under which the Consolidated Telegraph and Electrical Subway Company is now working.

The following is a list of the streets in which our wires are most numerous, and, therefore, the need for subways the most urgent:

Main subway from our station No. 210 Elizabeth street north on Elizabeth street to Prince street, and on Prince street to Broadway in one direction, and to the Bowery in the other.

Distributing ducts on the west side of Broadway from 14th street to the Battery. This should be started at once so as to be ready for our occupancy as soon as the main subways now being built upon the opposite side of the street.

Third avenue, distributing ducts on the east side from the extremity of the Bowery to 59th street.

Grand street, a main subway on one side of the street on from Broadway, from South Fifth avenue to East River, and distributing ducts on both sides of the street for some distance.

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We earnestly bring to the attention of the Board the foregoing needs, and think that it is only a matter of justice that we should be allowed some relief on the lines indicated.

Very respectfully yours,

THE BRUSH ELECTRIC ILLUMINATING COMPANY,

Per WILLIAM T. MOORE, President.

The communication of the Brush Company was, on motion of Mayor Grant, laid on the table for the time being.

Mayor Grant: There is an opinion here from the Corporation Counsel; but before that is read I would like to have placed on file a letter from the Central Labor Federation of New York, containing a resolution in relation to the recent accident at the corner of Chambers and Centre streets, adopted by that organization.

The Board ordered this letter placed on file.

Commissioner Gibbens: Before the Corporation Counsel's opinion is read I would like to submit this communication (laying it before the Board) handed to me to be submitted to the Board.

This communication, signed by H. K. Thurber, and addressed to the Board, in relation to the insulation of electric light wires, stating that powerful electric force can be transmitted through wires either overhead or underground with entire safety provided they are perfectly insulated, endorsing the "Safety seamless insulated wire" as being a perfectly insulated one and advocating its use, was read and ordered on file.

Commissioner Gibbens also laid before the Board a communication addressed to him by William Mayer, Jr., Electrical Expert, dated October 12th, 1889, in relation to the insulation and testing of overhead and underground electric light wires, and making suggestions in respect to the supervision of overhead wires.

This communication was read and ordered to be placed on file.

The following opinion of Corporation Counsel Clark was thereupon read:

NEW YORK, October, 1889.

HON. HUGH J. GRANT, Mayor:

DEAR SIR:—In answer to your inquiry, whether the acts creating the Board of Electrical Control and the contract made by that Board with the Consolidated Telegraph and Electrical Subway Company have vested in the last named Company an exclusive right to construct subways in the City of New York, I beg leave to advise:

1. The first act, compelling the use of subways for electrical conductors in cities (Chapter 534, Laws of 1884), directs that the corporations, associations or persons owning or controlling such conductors shall have the same removed from the surface of the streets or avenues of every city in the State on or before the first of November, 1885, and in case of failure to comply with said provision by the owners of said electrical conductors, the "local governments" of the cities affected are directed to remove such conductors, without delay, wherever found above ground. (Sections 2 and 3.)

Section 4 of the same act provides that "no city in this State shall grant any "exclusive privilege or franchise under this act to any corporation or individual "by which a monopoly may be created or competition prevented on equal terms."

2. Chapter 499 of the Laws of 1885 provides for a Board of Commissioners charged with the responsibility of enforcing the provisions of the act of 1884.

It is provided that in the system of subways proposed to be constructed no subways shall be constructed except upon plans approved by the Commissioners.

3. The Commissioners created by the last-mentioned act entered into an agreement with the Consolidated Telegraph and Electrical Subway Company, on the 22d of July, 1886, providing for the construction of subways. By the terms of this agreement the Board of Electrical Control granted to the said Company the right to build subways in accordance with the plans and specifications to be furnished and approved by the Commissioners.

The contract also provides that if at any time * * * there shall be a failure on the part of the said Company to carry out the provisions of the said agreement, * * * the Commissioners may enter into possession and control of the subways, which the Company agree to quietly and peaceably surrender to them.

There is nothing in the act which I have specified, or in the contract above referred to, which legally vests in said Consolidated Telegraph and Electrical Subway Company an exclusive right to construct subways in the city of New York.

4. A further and supplemental contract was made April the 7th, 1887, between the Commissioners and the same Company. There is, however, no provision in the contract vesting any exclusive right in the Company; and, on the contrary, it is expressly provided therein as follows: "And nothing in this contract, nor "in the contract hereby amended and modified, shall be construed as granting to "the party of the second part any exclusive privilege, immunity or franchise whatsoever."

5. By Chapter 716 of the Laws of 1887, the present Board of Electrical Control was constituted, and the agreement made by the Commissioners of Electrical Subways as modified by the supplemental agreement, is ratified and confirmed by the act.

The act also provided (Section 6) that "if at any time or for any reason the "said agreement so amended shall be or become inoperative or ineffectual for the "accomplishment of its just purpose, and the purposes of this act, or if the Company shall be unable or, after reasonable notice and opportunity given by the "said Board or its successors, shall fail, or decline to comply with or carry into

"effect the said agreement in all its terms, then in such event the said Board or "its successors may, with the approval of the Mayor, and the Counsel to the Corporation, make such new, further or different contracts, with the same or other "parties as may be reasonable or necessary to carry into effect the provisions and "intent of this act."

Not only is there nothing in this existing contract which does vest an exclusive privilege or franchise in the Subway Company, but on the contrary it is expressly declared that it shall not do so, and I am unable to discern any provision in the statute above referred to which vests an exclusive right to construct subways in the Consolidated Telegraph and Electrical Subway Company.

On the contrary, it is clear that under the express provisions of Section 6 of said act, if the present contract is "inoperative or ineffectual for the accomplishment of its just purpose and the purposes of the act," a new contract may be made.

Concisely stated the Board of Electrical Control have the power to make a new, further or different contract with the Company now building the subways or with other parties.

1. If, in the judgment of the Board, the Subway Company has failed to comply with or carry into effect the agreement of April 7, 1887, in all its terms, and if your Board determines that the subways already ordered have not been completed within the period during which said Company by the order of your Board was directed to complete said subways this would be a sufficient failure to comply with the terms of the contract of April 7, 1887, to authorize your Board to make other agreements with the same or other parties.

2. The Legislature in passing the act of 1887 seemed to have carefully provided for such an emergency as has arisen, for your Board has the power, if the agreement with the Subway Company has become inoperative or ineffectual for the accomplishment of the purposes of the act, namely, the placing underground of electrical conductors, to make new, further or different contracts with the same or other parties. Should your Board determine that the wires are not being placed underground with sufficient speed and that one Company is insufficient to do the necessary work, then it follows that the agreement made is inoperative and ineffectual and you may, without finding that the Subway Company is in default, make another contract, or as many contracts as you deem necessary to accomplish the object for which the Board was created.

Yours respectfully,

WILLIAM H. CLARK,

Counsel to the Corporation.

Mayor Grant: Unless there is some objection the opinion of the Corporation Counsel will be placed on file and spread upon the minutes. There appearing to be none, it will take that course.

Edward Lauterbach (President of the Consolidated Telegraph and Electrical Subway Company): In order that the position of the Subway Company may be placed on record, I will read a very brief communication.

Mr. Lauterbach thereupon read the following communication addressed to the Corporation Counsel:

NEW YORK, October 12, 1889.

HON. WILLIAM H. CLARK, Counsel to the Corporation, No. 2 Tryon Row, City:

DEAR SIR:—On behalf of the Consolidated Telegraph and Electrical Subway Company, we desire to submit to you the following statement:

On July 27th, 1886, an original contract was made by and between the Commissioners appointed under Chapter 499 of the Laws of 1885, as amended by Chapter 503 of the Laws of 1886. This contract was afterwards amended and modified by a second and further contract or agreement between the same parties, dated April 7, 1887. The provisions of the contract as thus amended required this Company to build subways in accordance with plans and specifications to be furnished by the Commissioners, afterwards the Board of Electrical Control. We were required and agreed (§2), upon reasonable demand of the Board to—

“adopt any and all necessary improvements that will increase the usefulness and efficiency of the system contemplated by this contract and the act above referred to,”

and the Commissioners reserved the right—

“to make such modifications and changes as may be reasonably necessary in the said subways or any of them, or the construction, plans, material or any other matter connected with them or any of them,”

and this Company, on its part, agreed to—

“conform to and carry out such changes and modifications when made.”

The thirteenth clause of the contract contains a grant to this Company of—

“the right to build subways in accordance with such plans and specifications”

as may be furnished by the Board of Electrical Control, and continues as follows:

“And said parties of the first part hereby agrees to use all lawful means within their power to compel all authorized companies or persons using electrical conductors to comply with the provisions of law and to place their conductors in said subways and to pay a fair rental for the space occupied therein.”

The contract thus made was not, in any respect, in the nature of a monopoly. It was entered into with this Company as being the party proposing to furnish the subways on the best terms after ample opportunity had been afforded to others to secure the opportunity to perform like service, but the competitors of this Company were unwilling to serve the public as cheaply and well as this Company, and we were preferred.

There is in the contract nothing in the nature of a monopoly. Not only is the right reserved to the Commissioners (now Board of Electrical Control) to change the plans and to adopt improvements, not only did we bind ourselves to conform to orders for such improvements, but, by the fourth provision of the contract, it was agreed that the spaces in the subways should be leased to

"any company or corporation having lawful power to operate electrical conductors in any street, avenue or highway in the City of New York that may apply for the same,"

and that no space not actually needed should be leased to any company

"to the exclusion or detriment of any other company or corporation needing spaces in said subways and desiring and able to pay for the same."

We agreed without charge to supply to the City of New York all space necessary for its electrical conductors and the electrical conductors of any of its departments, and that if space in such subways should at any time

"not be sufficient for all the companies or corporations so applying for the same, or for the City of New York or any of its departments, the additional space needed"

should be provided by this Company

"at its own cost by the construction, maintenance, equipment and operation of additional subways therefor, subject to the same conditions and same control by the parties of the first part."

A scale of rental was made at all times subject to the revision of the Commissioners (now Board of Electrical Control), and no contract was permitted which should not require the payment of rents at the fixed rates.

All profits over ten per cent. per annum are to be paid into the treasury of the City of New York. This contract containing these wise provisions for the security and profit of the city and the advantage of the producers of electrical forces was afterward ratified by the Legislature of New York, by Chapter 613 of the Laws of 1887, and passed June 25th, 1887, and approved by the Governor, entitled "An Act in relation to electrical conductors in the City of New York;" the former Commissioners of Electrical Subways, together with the Mayor, for the time being, are constituted the Board of Electrical Control, and all proceedings of the Commissioners are transferred to the Board of Electrical Control.

The sixth section of this act is in the following words:

"The agreement made by and between the Commissioners of Electrical Subways for the City of New York and the Consolidated Telegraph and Electrical Subway Company (a corporation duly organized and existing under the laws of this State), under date of July 27, 1886, when and as amended and modified by a second and further contract or agreement between the same parties, dated the 7th day of April, 1887, is hereby ratified and confirmed, subject, however, to all the provisions of this act, but if at any time and for any reason the said agreement shall be or become inoperative or ineffectual for the accomplishment of its just purposes or the purposes of this act, or if the said company shall be unable or after reasonable notice and opportunity given by the said Board or its successors, it shall fail or decline to comply with or carry into effect the said agreement with all its terms, then, in such event, the said Board or its successors may, with the approval of the Mayor, and the Counsel to the Corporation of the City of New York, make such new, further or different contracts with the same or other parties as may be reasonable or necessary to carry into effect the provisions and intent of this act."

The seventh section of the act authorizes any of the Justices of the Supreme Court, Court of Common Pleas or Superior Court, upon its being shown that any officer or agent of the Board or of this Company or any corporations or persons claiming under the Board, shall have failed to have observed or fully performed the provisions of this act or either of the acts herein before mentioned

"or of the said agreement or shall have failed to have furnished just and equal facilities under this act or the said agreement to any and all corporations lawfully competent to manufacture, use or supply electricity or to operate electrical conductors in any street, avenue or highway in the City of New York, applying for such facilities, upon terms that to the Court shall appear just and reasonable,"

in every such case a writ of mandamus may be granted to enforce

"the provisions of this act or of the acts above mentioned or of the said agreement or of any agreement made under the said acts or compel the granting of such relief as may be proper in the premises."

You are familiar with the attacks which have been from time to time made in the courts of this city upon these provisions of law and this contract by Peter McGinnis and by the United States Illuminating Company, and you are also aware of the fact that the law and the contracts have, in all respects, been fully sustained in each such occasion.

You are also doubtless aware (if not, we take pleasure in notifying you) that this Company is not, in any respect, in default in the performance of its part of the agreements so entered into, but is now and has always been ready and willing to perform the same and has performed the same as made.

We therefore respectfully submit that this Company is entitled to the friendly support and protection of yourself, as the head of the great office of Counsel to the Corporation and your associates and of all other public officers. The force of this reasonable suggestion is not diminished but rather strengthened by the fact that by the terms of the eighth section of the act of June 25, 1887, the Commissioners of the Sinking Fund are authorized to purchase the subways of this Company at a price not exceeding ten per cent. in addition to actual cost.

Every reasonable precaution seems to be contained in the law, therefore, for the protection of the city, and the Company which has conceded so much and performed so faithfully and full looks to you as the representative of the Law Department of the city for support as against any attempt to deprive it of such reasonable reward as it may be entitled to under the contract.

Whenever complaint shall be made, as has not yet been done, that this Company is in any respect in default, it will gladly listen to the same, and endeavor upon the "reasonable notice" to which the act entitles it to comply with and carry into effect the agreement in any particular in which it may seem to be in such default, but it hopes to be able throughout the whole term of the contract, ending in 1897, to comply as it has heretofore without such complaint.

Respectfully yours,

EDWARD LAUTERBACH, Pres. Con. Tel. & Elec. Subway Company.

HOADLEY, LAUTERBACH & JOHNSON, of Counsel.

The Board, on motion of Commissioner Gibbens, ordered the communication of the Consolidated Telegraph and Electrical Subway Company to be spread on the minutes.

Mayor Grant offered the following resolution :

Resolved, That the numerous deaths caused by electric light and power wires within the last thirty days and the shocking manner in which they have occurred furnish ample and sufficient proof that such wires are not being placed under ground with a speed sufficient to insure the safety of the lives of the people of this city, and in view of the imperative demand for greater subway facilities, the Board does hereby determine that the contract made and entered into between the Commissioners constituting this Board and the Consolidated Telegraph and Electrical Subway Company on April 7, 1887, is now inoperative and ineffectual for the accomplishment of its just purposes and the purposes of Chapter 716 of the Laws of 1887.

Mr. Lauterbach, President of the Consolidated Telegraph and Electrical Subway Company, upon invitation of Mayor Grant, spoke to the resolution offered by him, reiterating the statements in reference to his Company made at the meeting of the Board held October 9th instant, defending his Company, asserting that it had fulfilled all its obligations, had done all the work ordered by the Board, would complete the Third avenue subway by the 1st of December, and that it was not in default, neither had received notice of any default. He further stated that his Company had a great amount of material on hand and would speedily complete all the work heretofore ordered, and he requested the Board to call upon Engineer Kearny to make his report under the resolution of the Board adopted on the 12th instant directing him to submit at this meeting a comprehensive system of electric light subways, in order that he might be informed of the extent of the work required to be done and be able to tell the Board whether or not his Company could perform it.

Wheeler H. Peckham, representing the Standard Electrical Subway Company, repeated the proposition made in behalf of his Company at a recent previous meeting of the Board to make a contract with the Board to build subways, declaring that the present Subway Company had been at work for more than three years and had done comparatively nothing, and stating that the Standard Company was ready with men and means and was prepared to go to work at once.

The Board discussed the resolution offered by Mayor Grant at great length, and in connection therewith and with the right of others beside the Consolidated Company to make contracts with the Board to build subways, heard statements and arguments from Mr. Cravath, Mr. Choate, and Mr. Jackson, all representing the Safety Electric Light and Power Company, the United States Illuminating Company and the Brush Electric Illuminating, each of these companies desiring and making application to build subways for its own accommodation.

Commissioner Hess: I will call for a division of the resolution. Just read that first part.

The part, as follows, was then read:

Resolved, That the numerous deaths caused by electric light and power wires within the last thirty days and the shocking manner in which they have occurred furnish ample and sufficient proof that such wires are not being placed under ground with a speed sufficient to insure the safety of the lives of the people of this city.

Mayor Grant: Now read the other portion of it.

The remaining portion was then read.

Commissioner Gibbens: I move in the place of that resolution the following:

Resolved, That the Engineer be directed to report to this Board this comprehensive system of subways which he was desired by a previous resolution to report and the Consolidated Telegraph and Electrical Subway Company be ordered to build those subways immediately.

Mayor Grant: Before voting the Chair would like to have recorded as follows: That a motion to act upon a report of the Engineer would necessarily follow after a vote having been taken in the affirmative on the resolution offered by the Chair; that it is virtually a vote in the negative on the resolution offered formerly, and therefore the Chair votes "no."

Commissioner Hess. I cannot vote for the resolution because I have not seen the report. I vote "no."

Commissioners Gibbens and Moss voted "aye."

The Chair declared the substitute of Commissioner Gibbens lost.

Commissioner Hess offered the following amendment:

Resolved, That the numerous deaths caused by electric light and power wires within the last thirty days and the shocking manner in which they have occurred furnish ample and sufficient proof that such wires are not being placed under ground with a speed sufficient to insure the safety of the lives of the people of this city, and in view of the demand for greater subway facilities the Board does hereby direct the Engineer of this Board to present his report at this time as directed at the last meeting of the Board.

Mayor Grant: For the reasons before given the Chair will, of course, oppose the motion. I would of course oppose the motion until such time as there was a vote on the original motion of my own. Subsequent to that I will be pleased to hear the Engineer's report.

Commissioner Gibbens: I am opposed to that motion for the following reasons: Because I don't believe that the deaths which have occurred in the city of New York recently from overhead wires used for electric lighting are due to the fact that the Board of Electrical Control or anybody else interested has not put wires underground as rapidly as possible, but are due to the fact that the companies operating said wires have not obeyed the rules of the Board and have not insulated their wires properly.

On the roll-call Commissioner Hess voted "aye," all others, "no."

The amendment was declared lost.

Mayor Grant: I call for the original resolution. The Secretary will call.

The vote on the call was Mayor Grant "aye," Commissioners Hess, Gibbens and Moss "no."

The resolution was lost.

Mr. Cravath: I hereby offer in behalf of the Brush Electric Illuminating Company, the United States Illuminating Company and the Safety Electric Light and Power Company to build promptly, with as many men as we can find room for in the streets, any portion of said subways and lease the spaces therein to the companies desiring to occupy them, at rentals 25 per cent. less than those being charged by the Consolidated Telegraph and Electrical Subway Company, and we will make that a portion of the contract and of the bond, and will continue that scale of rentals throughout. I make that offer in good faith, and we will give bonds for \$750,000, and I would like to have a resolution covering that put before the Board.

Mr. Peckham: The Standard Company will do the same thing.

Commissioner Gibbens offered the following resolution:

Resolved, That the report of the Engineer be read.

Unanimously adopted.

The report of Engineer Kearny, as follows, was then read:

To the Honorable, The Board of Electrical Control:

GENTLEMEN:—With reference to the resolution of your Board passed at the meeting held on the 12th of October, 1889, which reads as follows:

"Resolved, That the Engineer of this Board be prepared on Monday to have a comprehensive system of subways for electric lighting, to an extent that it will cover as much of the city as possible, to present to the Board,"

I respectfully submit the following report:

The general plan of the Board of Electrical Control as described in its report is as follows:

A comprehensive system of underground conduits suitable for the practical use of companies operating electrical conductors and wherein electrical conductors may be operated without diminishing the efficiency of the service and affording protection to said electrical conductors from deleterious influence external to said conduits. The material, form, size and position of said conduits to be determined by the particular service and locality for which they are designed, the said system to be so designed and constructed as to afford accommodation on fair and impartial terms to all companies and others duly authorized to make use of the same, affording the greatest possible convenience for placing, removing, repairing, altering and connecting said conductors, combined with the least possible interference with the other uses to which the public streets and highways of the city of New York are subject, said system to be in a manner used and controlled so that fair and impartial treatment of all companies and others authorized to operate electrical conductors may be assured and the greatest safety and efficiency obtained.

It is a matter of doubt with me from the language of the resolution of the Board whether the report desired is as to the form and material construction of the subways to be ordered for electric lighting conductors, or whether the Commissioners are solicitous as to the streets and avenues where subways for electric lighting conductors should be laid at once. I therefore submit an opinion as to both of these points.

First. As to the construction of the subways for electric lighting conductors. The proper subway for the use of companies engaged in the business of electric lighting is the subway which has been recently ordered by the Board of Electrical Control on Broadway and in other streets, and which may be defined as follows: Iron pipe three inches in diameter, with screw joints, laid in hydraulic cement, terminating in manholes about every two hundred feet, having handhole boxes for distribution at the distance of about twenty-five feet, into which the upper tier of ducts run, substantially as set out in the accompanying drawing. The number of ducts to be laid in any street or avenue must depend somewhat upon the exigencies of the business of the electric lighting companies in that locality. It is absolutely necessary to know the permanent location of the electric lighting stations and their capacity, in order to provide the requisite subways for them. Though I have repeatedly written to all the electric companies for information, I have received replies only in two instances, viz., for the stations at 29th street and East River and 24th street and North River, and the subways from these points will soon be completed.

Second. As to the streets and avenues where subways should be laid immediately, I have to submit the following recommendation:

The subways for electric lighting which have already been constructed under the supervision of the Board of Electrical Control are the following:

On Broadway, from 59th to Canal streets; on Sixth avenue, from 14th to 59th streets; on 14th street, from Sixth avenue to First avenue; on 29th street, 42d street and 59th street, from Broadway to First avenue; on 125th street, from Eighth to First avenues; on Third avenue, from 14th to 36th streets; and in many other cross-town streets connecting with the above.

In addition to these subways others have been ordered and are in process of con-

struction, viz.: On Third avenue, from Chatham square to the Harlem River; on Broadway, from the Battery to the Central Park; and in certain other locations.

It will be seen, therefore, that a thorough route on three of the principal avenues is practically provided, and the additional construction most required is for connections with these through routes.

The stations of the different electric lighting companies are distributed throughout the city as follows:

United States Illuminating Company, 36 Stanton street, 208 Fulton street, 29th street and East River, Washington street, near Cortlandt street, and foot of 24th street and North River.

Brush Electric Illuminating Company, 210 Elizabeth street.

East River Electric Light Company, 24th street and East River.

Mount Morris Electric Light Company, Vandam and Greenwich streets.

Harlem Lighting Company, 80th street and Avenue B.

Ball Electric Lighting Company, 38th street, near Broadway.

Hall Electric Power Company, 83 Centre street.

Daft Electric Power Company, Spruce street, Gold street, near William street, Frank Leslie's Building, College place, and Ninth avenue, near 13th street.

I therefore recommend to the Board the ordering of subways from the stations above specified to the main lines constructed or in process of construction, as above stated.

It will be seen from the plan that accompanies this report that certain of the stations in certain districts are already provided for, that is to say, there is a cross-town subway now being constructed in 23d street; one has already been constructed in 14th street. The 29th street subway provides for overhead wires in that vicinity, and the 42d street, 59th street and 125th street subways do the same for their environment.

It will be seen, therefore, that the localities where subways are needed most for electric light wires are cross-town subways in the lower part of the city, from the electric light stations to connect with the lines of subways already constructed, or in process of construction, running up and down the city, and which I have frequently urged the Board to have built during the last three months. The recommendations which I reiterate, are, therefore, subways of the construction described above in the following streets:

In Houston street, from First avenue to Hancock street; in Washington street, from Cortlandt to Fulton street, and through Fulton street to Broadway, connecting with the Broadway and Third avenue subways.

These crosstown routes can readily be connected with all the stations now used for generating electric light and power, and will enable the companies to operate their wires from their stations extensively underground.

It is perhaps well for me at this time to inform the Board with reference to the practicability of building these subways during the present season. The construction which I recommend is not covered by any patents, and the material can be had from any iron pipe manufacturers. There is always a considerable amount of iron pipe in the market, and it is probable that all the subways herein recommended can be built during the present season, if ordered by the Board at

once. The subways which have heretofore been ordered by the Board are completed or in process of construction.

Should the Board see fit to indorse the recommendations herein contained it will be necessary to take immediate action, if it is contemplated to complete the work before the setting in of cold weather; but with an open winter, such as we had last year, there is no reason why work should not be continued in the winter season.

All of which is very respectfully submitted.

HENRY S. KEARNY,

Chief Engineer of the Board of Electrical Control.

Mayor Grant stated that he had several other meetings to attend during the afternoon, and requested that action on the report of Engineer Kearny be deferred to a meeting to be held on Tuesday.

The Board so ordered.

The Board hereupon adjourned to Tuesday, October 15th, 1889, at 11 o'clock A. M.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Tuesday, October 15th, 1889, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant; Commissioners Jacob Hess, Daniel L. Gibbens and Theodore Moss.

The minutes of the last meeting were read and approved.

Commissioner Gibbens offered the following preamble and resolution:

Whereas, At a previous meeting of this Board a resolution was passed calling upon electrical companies to refrain from using all badly insulated wires, and

Whereas, Said companies did not so refrain, whereby life was sacrificed; therefore be it

Resolved, That notice is hereby given to all electric lighting companies to cease from using overhead wires in the city of New York for the purpose of carrying currents of any intensity greater than 300 volts until such time as it shall be shown to this Board that said overhead wires are properly insulated and safe and comply in all respects with the rules and regulations of the Board; and

permission to operate such currents over such overhead conductors is hereby expressly revoked pending investigation.

(Not acted on.)

The Board discussed this resolution at great length, all the members taking part. Finally, upon the suggestion of Mayor Grant that the passage of the resolution might be in contempt of the injunctions recently obtained by the several electric lighting companies, Corporation Counsel Clark was sent for, appeared before the Board, and gave the following oral opinion:

"I want to state to the Board that the injunction obtained by the United States Illuminating Company—the other injunctions I have sent for, but not yet obtained—restrains your Board from interfering with its business; and the passage of a resolution to interfere with its business would be an interference with the business of that company."

No further action was taken in respect to the resolution.

Mr. Bernheim, representing the Manhattan Electric Light Company, stated to the Board that it was possible to insulate high-tension currents and that his company had properly insulated wire and no other. Mr. Bernheim gave facts and figures in support of these statements, and offered to pay the expense of inspectors to be appointed by the Board for the purpose of making examination of his company's wires, in order that the Board's Electrical Expert might be able to certify as to their proper and safe condition, if found so to be.

H. M. Hawkesworth (General Manager of the Daft Electric Power Company) stated to the Board that his company did no lighting, but that its business was that of furnishing power; in one of its stations the highest electro-motive force of the current was 110 volts, and in its other station 220 volts, perfectly harmless currents; it was operating 1,250 industries employing several thousand men; its insulation in every case was of the best and most approved methods. Mr. Hawkesworth concluded his statement by asking the Board to except his company from the operation of the resolution passed on the 9th instant forbidding the use by electric light companies of dangerous currents.

The Board took up and considered the report of Engineer Kearny, deferred from the meeting of Monday.

Engineer Kearny stated that in the short time allowed him to bring in the comprehensive plan of subways contemplated by the resolution he had been unable to do it.

Wheeler H. Peckham (representing the Standard Electrical Company) laid before the Board a map of the city containing the plan of his company for a

comprehensive system of subways, and had an expert of his company explain the plan.

Mr. Lauterbach (President of the Construction Company) stated that his company would be able to do the work contemplated by the plan of Mr. Peckham's Company in three years. He also stated that his company would do the work recommended by the report of Engineer Kearny during the present season, as will be seen from the following colloquy in respect thereto:

Mayor Grant: When do you propose to complete this work?

Mr. Lauterbach: This season.

Mayor Grant: The 15th or 1st?

Mr. Lauterbach: The season usually terminates on the 15th of December.

Mayor Grant: Make this the 15th of December.

Commissioner Gibbens moved the following resolution:

Resolved, That the work which has been suggested to the Board in the report of the Engineer, and of which we have a diagram before us, be ordered to be completed this season.

Unanimously adopted.

Commissioner Hess: I offer a resolution, as follows:

Resolved, That the Engineer be directed to present to this Board, at its next meeting, a comprehensive plan of subways for electric lighting in the city of New York.

Unanimously adopted.

The Board hereupon, on motion of Commissioner Hess, adjourned sine die.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, January 8th, 1890, at 1 o'clock P. M.

Present: Mayor Hugh J. Grant, President; Commissioner Jacob Hess, Commissioner Daniel L. Gibbens.

The minutes of the last meeting were read and approved.

The following report of Engineer Henry S. Kearny was read:

NEW YORK, January 3d, 1890.

To the Board of Electrical Control:

GENTLEMEN:—Since the last report acted upon by you, the following streets and avenues have been provided with subways for telephone and telegraph wires:

Broad street from Exchange place to Wall street,
Nassau street from Wall street to Pine street,
Wall street from Nassau street to Pearl street,
Cedar street from Church street to Pier 13, N. R.,
John street from Nassau street to near Broadway,
Dey street from Church street to Greenwich street,
Barclay street from College place to West street,
Murray street from College place to Broadway,
Houston street from Chyrsitie street to First avenue,
Centre street from Reade street to Grand street,
38th street from Lexington avenue to First avenue,
45th street from Sixth avenue to Broadway,
58th street from Eighth avenue to Tenth avenue,
Tenth avenue from 58th street to 59th street,
Lexington avenue from 65th street to 79th street,
79th street from First avenue to Fourth avenue.

The following streets have been provided with subways for electric light and power conductors:

29th street from First avenue to Broadway,
42d street from First avenue to Broadway,
125th street, north side, from Second avenue to Third avenue, and across Fourth avenue,
125th street, south side, from First to Eighth avenue,
59th street from First avenue to Broadway,
Seventh avenue from 45th street to 58th street,
Eighth avenue from 45th street to 59th street,
Lenox avenue from 125th street to 122d street,
Washington street from station north of Cortlandt street to Fulton street,
Fulton street from Washington street to Broadway,
Houston street from First avenue to Cottage place,
Bowery from Chatham Square to 6th street,
Third avenue from 6th street to 130th street,
Broadway from Beaver to 14th street,
14th street from First avenue to Sixth avenue,

22d street from Broadway to Fourth avenue,
Sixth avenue, west side, from 14th to 24th street,
Sixth avenue, east side, from 14th to 18th street,
23d street from Fifth avenue to Eleventh avenue, up Eleventh avenue to 24th street,
and west on 24th street to Electric Light Station.
Crossings on Broadway,
Crossings on Sixth avenue.

The directions of the Board with reference to the building of subways have been substantially carried out by the Consolidated Telegraph and Electrical Subway Company, and of all the work ordered the only part not completed is a subway for telegraph and telephone conductors in 18th street from Seventh to Eighth avenue, and along Eighth avenue from 18th street to 38th street, and certain construction of the Edison system, which was ordered some time since on the understanding that it should be done at the times when the streets are opened for general construction. The Eighth avenue telephone subway was not considered so urgent a necessity as the electric light subway ordered.

Since the action of the Board calling attention to the fact that the work of constructing subways was not proceeding with proper rapidity, great improvement has been made and the work has been pushed with energy.

The condition of the subways is very satisfactory, in the main. They are comparatively free from moisture and gases.

The question of ventilation is receiving attention, under the recommendations made in the report of the committee on explosions signed by Commissioners Gilroy and Gibbens. In all of this year's construction a six-inch pipe for the purpose of ventilation has been led into each man-hole, forming a continuous and open channel for the forcing in of fresh air and forcing out of gases and vapors. Numerous places along the routes of the subways are being provided with air-pumps and fans, and it may be reasonably expected that a short time will bring about the complete ventilation of the entire system in the manner indicated.

No serious difficulties arising from the escape of steam from the pipes of the Steam Heating Company have been experienced lately. It should not be forgotten, however, that the remedy for escaping gas and steam in the streets is not properly one which should have to be provided by others than the corporation using the streets to conduct the steam and gas. The escape of steam and gas can and should be provided against by these corporations; and until it is so provided against by them dangers and difficulties will result, both in the subways and elsewhere. The numerous explosions in sewers and subways and the recent explosion in the Minetta lane sewer is conclusive evidence on this point.

I have to recommend, under the resolution directing me to bring in a comprehensive system of subways for electric light wires, that the streets and avenues designated upon the accompanying map be provided with subways during the coming season. And should this recommendation meet with the approval of the Board, upon the completion of the work much greater facilities for electric lighting will be afforded in the subways than have heretofore been required by the Companies. In laying out the routes recommended, I have been guided by the requirements of the present service and the recommendations and suggestions of the electrical companies, whenever such were obtainable. It is recommended that the subways here spoken of be constructed of the same

material, with the same provisions for the distribution, as in the case of the electric light subways recently constructed on Broadway and Third avenue; that is to say, iron pipe laid in hydraulic cement concrete, with man-holes at street corners, and hand-hole boxes in front of house lines. The number of ducts in each street is to be determined by the requirements of the electrical companies, so far as they can be ascertained, with a reasonable provision for increase of business. I recommend that twenty be the number ordered—to be increased or diminished in the discretion of your Engineer.

The streets and avenues designated are the following:

Whitehall street from Battery place to Pearl,
Broad, South William and William streets from Bridge street to New Chambers street,
Park row from Broadway to New Chambers street,
Washington street from Fulton to Chambers,
Greenwich street from Battery place to West 12th street,
First avenue from Houston street to 130th street,
Second avenue from Houston street to 59th street,
Fourth avenue from 14th street to 34th street,
Fifth avenue from 8th to 59th streets,
Sixth avenue, Carmine and Varick streets from 14th to West Houston streets,
Seventh avenue from 14th street to 45th street,
Eighth avenue from 14th to 45th street,
Ninth avenue from West 12th street to 59th street,
Tenth avenue from 14th street to 59th street,
Eleventh avenue from 14th street to 59th street,
Battery place from Greenwich street to Whitehall street,
Bridge street from Whitehall street to Broad street,
Rector street from Greenwich street to Broadway,
Liberty street from West street to William,
Dey street from West to Washington street,
Fulton street from Broadway to South street,
Chambers street from West street to Bowery,
Franklin street from Greenwich street to Broadway,
Canal street from West street to Bowery,
Houston street from Greenwich street to Hancock street,
8th street from First avenue to Sixth avenue,
14th street from Sixth avenue to Eleventh avenue,
23d street from First avenue to Fourth avenue,
29th street from Broadway to Sixth avenue,
34th street from First avenue to Eleventh avenue,
42d street from Broadway to Eleventh avenue,
50th street from Eighth avenue to Eleventh avenue,
80th street from First avenue to Third avenue,
Grand street from Broadway to East River.

With reference to increased facilities for the wires of the telephone and telegraph companies, I recommend the routes designated on the accompanying map and the same construction as in the case of this year's work for that service; that is to say, iron pipe laid in hydraulic cement concrete. The number of ducts to be ten, subject to increase in the discretion of the Engineer.

The streets and avenues are the following:

Greene street from Spring to Canal,
18th street from Seventh avenue to Eighth avenue,
Eighth avenue from 18th street to 38th street,
23d street from Second avenue to Madison avenue,
58th street from Tenth avenue to North River,
79th street from First avenue to Avenue A,
124th street from Lexington to St. Nicholas avenue,
Lexington avenue from 58th street to 21st street,
21st street from Lexington avenue to Fourth avenue,
Fourth avenue from 21st street to 14th street,
Lexington avenue from 79th street to 129th street,
129th street from Lexington avenue to Third avenue,
Third avenue from 129th street to the river.

The Western Union Telegraph Company is provided for on the Elevated Railroad, and with the cross-town subways recommended they should be able to dispense with all pole lines in the streets of New York.

Further recommendations will be made to the Board as rapidly as the requirements of the service can be ascertained.

Very respectfully,

HENRY S. KEARNY, Engineer of Board.

Mayor Grant called upon Secretary Trainer to read the resolution of the last meeting under which Engineer Kearny made his report. The resolution was read. The Mayor thereupon stated that the Engineer had included in his report a plan of subways for telephone and telegraph service, and that this had not been contemplated by the resolution. He also questioned Engineer Kearny in connection with his report, the following being the more important questions and answers:

Mayor Grant: There is included in the report subways for telephone and telegraph service; I do not think it was called for; I understood Mr. Kearny to say at the last meeting that such a thing was not possible.

Mr. Kearny: Not possible to construct it or to recommend it?

Mayor Grant: To lay out such a plan as this.

Engineer Kearny: In two days' time.

Mayor Grant: How long do you think it will take to construct this?

Mr. Kearny: Two years' work there, I should estimate; I suppose some might step forward and say they would do it in one year; I should say there is two years' work.

Mayor Grant: Do you mean both the electric light and the telephone and telegraph subways?

Mr. Kearny: It could be done in two years—all together.

Mayor Grant: How long to do this electric lighting?

Mr. Kearny: I should estimate two years; it might be done in one; it is only a question of men.

Mayor Grant: As I understand the report, the Broadway line as ordered by this Board, has been completed, has it not?

Mr. Kearny: Yes, sir.

Mayor Grant: When was it completed?

Mr. Kearny: Approximately, the last week in December.

Mayor Grant: The Third avenue line that we ordered?

Mr. Kearny: The last of December.

Mayor Grant: Was it in a condition at the latter end of December to put cables in?

Mr. Kearny: Not satisfactorily—in parts of it only.

Mayor Grant: Now, during the last year—I want to say to you before I say anything about this that I thoroughly agree with the building of the subways that have been built—but I want to know by what authority they have been building those subways that were not included in those others at that time?

Mr. Kearny: I do not understand any subways have been built except those that have been ordered, except two blocks in Lenox avenue that were necessary to be built as a subsidiary.

Mayor Grant: That was built without any order at all?

Mr. Kearny: Yes, sir.

Mayor Grant: Did they not always come here for the subsidiary connections before?

Mr. Kearny: I do not understand they have asked this Board to build subsidiaries.

Mayor Grant: Did you not recommend a meeting or two ago subsidiary connections on Broadway?

Mr. Kearny: No, sir.

Mayor Grant: Across Broadway?

Mr. Kearny: Those were crossings.

Mayor Grant: Do you call Lenox avenue a subsidiary?

Mr. Kearny: It is similar to a great many other subsidiaries; it does not preclude the possibility of building a—extending a subway; that is my definition of a subsidiary; it was built for the accommodation of one person—at their request.

Mayor Grant: How long is it?

Mr. Kearny: Two blocks.

Mayor Grant: It is a subsidiary?

Mr. Kearny: Yes; I don't consider the length of it would make the difference; I say if it were built for an individual it would be a subsidiary; if it were built for the general accommodation it would not be.

Mayor Grant: There were certain avenues—I will say Eighth avenue, Tenth avenue, when were they ordered?

Mr. Kearny: Eighth avenue was ordered, I should think, two years ago; at one of the first meetings of the Board last year all the incompletd work was ordered.

After some further questioning of Mr. Kearny in regard to certain records and maps of the Board, by Mayor Grant, and criticism by him of the manner of keeping such records and the minutes of the Board,

Commissioner Gibbens offered the following resolution: °

Resolved, That the report of the Engineer be spread upon the minutes.

Which resolution was unanimously adopted.

Commissioner Gibbens also thereupon offered the following other resolution:

Resolved, That the recommendations for the building of subways, as set out in the report of the Engineer made to this Board this day, be approved, and the Consolidated Telegraph and Electrical Subway Company be directed to proceed with the building of subways as rapidly as the weather will permit, and that the following subways be begun at once:

1. The subway on 80th street from the East River to Third avenue;
2. The subway from 29th street and First avenue to 24th street and First avenue;
3. The subway from the corner of Houston and Hancock street to the corner of Vandam and Greenwich street;
4. The subway from Chatham Square and the Bowery, to connect with the Broadway subway as designated in the report of the Engineer. And

Resolved, That the Consolidated Telegraph and Electrical Subway Company be directed to proceed as rapidly as possible with the construction of all subsidiary connections which may be required by the Electric Lighting Companies, to enable them to make underground connections with subways already provided, in the mode designated in the general notice of this Board to companies required to place their wires underground.

(Withdrawn.)

Commissioner Gibbens stated, in respect to his resolution, as follows:

"In explaining this resolution I will say, I have had some conversation with the Commissioner of Public Works on this subject, and I think it his opinion that the subways should be constructed as rapidly as the weather will permit; and when there is open weather he is willing to issue permits for the work to go on—not only anxious from the standpoint of the citizens who desire to see the electric light wires buried, but also anxious because there is considerable new pavement to go down during the coming year. The reason I have selected these particular spots as the places where the work should be begun at once is because those subways which are referred to in the resolution are ones which will enable the Electric Light Companies to connect from their stations to the subways, and that will be a great gain in enabling them to have their wires which are in the subways enter the subways underground."

Mayor Grant also stated, as follows:

"I want to say, of course all this is entirely new to me. You have the advantage of knowing just what this is, and I think that at least I may be permitted to have an opportunity of talking with the Commissioner of Public Works upon the subject before the report is adopted. I shall not vote for the resolution until I have had that opportunity."

Commissioner Gilroy, who was present, said that he desired to state that it would be a difficult matter for the Department of Public Works to grant permits where there is much traffic.

Mayor Grant further stated that he would like to have an opportunity of reading the report over himself and talking to the Commissioner of Public Works about it.

Commissioner Hess: I think that is a fair proposition.

Commissioner Gibbens: I withdraw the resolution, and offer the following substitute:

Resolved, That the Engineer of the Board be directed to confer with the Commissioner of Public Works on the subject of the work which he has reported upon.

Unanimously adopted.

Commissioner Gibbens suggested as the next thing in order the report of the Expert of the Board.

Expert Wheeler thereupon commenced the reading of his report, and had read to some considerable length, when

Mayor Grant stated that he desired to read the whole report before acting on it, and moved the following resolution:

Resolved, That the Report of the Expert of the Board be spread upon the minutes. Unanimously adopted.

(See appendix to minutes for Report of the Expert to the Board.)

The reading of the annual Report to the Governor and the Legislature was hereupon commenced, and, pending its reading, Mayor Grant made the following statement:

"I want to say that Mr. Gibbens let me have a copy of a report that I understand from him now is substantially this report. There are certain things in it that I agree with, and others that I do not agree with. I have stated to Commissioner Gibbens—as this report is only a copy of the one had by me, with the exception of certain blanks filled out in this report—I am perfectly willing to act upon it now, as I suppose I have the sense of it. I am frank to say that I cannot vote for the report because of certain things in it that are not within my knowledge, and because of a certain other matter in the report that I would rather have no say in."

Whereupon, without further reading,

Commissioner Gibbens offered the following resolution:

Resolved, That the Report as proposed be the Report of this Board to the Governor and the Members of the Legislature, and the same be printed and transmitted, and that there be printed with the said Report an appendix, containing the Reports of the Engineer and Electrical Expert of this Board, the acts relating to electrical conductors in the city of New York, the contracts entered into by this Board and its predecessors, the legal opinions which have been rendered by the courts in interpreting these acts and contracts, the rules and regulations and forms of the Board, the affidavits mentioned in the Report, the Report of the Committee on Explosions, and the cuts showing different methods of distributing electrical conductors in connection with the subways which have been constructed.

Adopted. Vote: Commissioners Hess and Gibbens, "aye"; Mayor Grant, "no."

(See appendix for Report to Governor and Legislature.)

Commissioner Gibbens: There are certain applications here.

Mayor Grant: Applications for what?

Commissioner Hess: Applications for franchises.

Commissioner Gibbens: There are some applications for franchises here which have been referred to me.

Mayor Grant: They are laid over until the next meeting.

The following communication from the Department of Police was read:

NEW YORK, Nov. 26, 1889.

To the Hon. Board of Electrical Control, City of New York:

GENTLEMEN:—At a meeting of the Board of Police held this day it was

Resolved, That the Board of Electrical Control be and is hereby respectfully requested to grant permission for the construction of temporary branch subways and the

placing therein of the wires of the Police Department, by the Standard Underground Cable Company, in accordance with its contract for the performance of the said work, for the short distances between the public subways and the several station houses in the said contract.

The places referred to are as follows:

West street from Spring street to Pier 41, N. R.,
Battery place from Broadway to Pier A, N. R.,
Broad street from Exchange place to Wall street, and Wall street to No. 13,
Chambers street from Cottage place to Chambers Street Hospital,
Park Row to Third Precinct Station House, City Hall,
Pearl street from Frankfort street to Oak street, and Oak street to No. 9,
Leonard street from Broadway to Tombs Prison.
Leonard street from West Broadway to 19 and 21,
Elizabeth street from Grand street, south to 19 and 21,
Mulberry street from Grand street to No. 205.

Very respectfully,

WM. H. KIPP, Chief Clerk.

Commissioner Gibbens, whereupon, offered the following resolution:

Resolved, That the Secretary be directed to reply to the letter of the Police Department of the 26th of November, to the effect that this Board cannot permit the Standard Underground Cable Company to open the streets for the purpose of building subways, but that the Police Department is authorized to open the streets for the purpose of making connections, and wherever such connections are necessary, subject to the approval of the Department of Public Works, either through the Standard Underground Cable Company or any other agent the Police Department may see fit to employ.

Which was not passed.

Mayor Grant offering the following substitute:

Resolved, That the communication of the Police Department of the 26th of November be referred to the Engineer of the Board, with directions to confer with the Police Department.

Which was unanimously adopted.

The following communication was read:

METROPOLITAN TELEPHONE AND TELEGRAPH COMPANY,
18 CORTLANDT STREET.

NEW YORK, NOV. 29, 1889.

W. H. ECKERT, ESQ., Gen. Manager:

DEAR SIR:—Mr. David Edwards, of this Department, has sought to obtain the right from the Fulton Market to erect a 20-ft. portable fixture with two ten pin cross arms. This for the purpose of concentrating the subscribers' wires in the market and adjoining wharves, Nos. 23 and 24 East River.

He was referred by Mr. Daily, Supt. of the Market, to Engineer of Comptroller's Department, by him to Comptroller Myers, and in turn to Commissioner Gilroy, where he was informed by Mr. Clifford, Chief Clerk, that Mr. Gilroy would not give his consent unless we first obtained a permit from the Board of Electrical Control. You have explained to me Commissioner Gilroy's attitude in these matters, and I desire instructions before proceeding any further. Section 79, which is the one in question, takes up the three blocks between Fulton and Beekman and between South and Pearl. On the western boundary of this section the Pearl street subway runs and our terminal is at 109 Beekman street. It is on the south side of Beekman just east of Pearl. We seek to cross the three streets, South, Front and Water and there are but 28 subscribers in this section.

Yours very truly,

E. W. CARRITT.

Commissioner Gibbens thereupon offered the following resolution:

Resolved, That the Metropolitan Telephone and Telegraph Company be and is hereby permitted to make aerial connections with the subways from the pole at 109 Beekman street, for the purpose of supplying subscribers in Fulton Market and the adjoining wharves, subject to the consent of the Superintendent of Markets.

(Withdrawn.)

Commissioner Gibbens withdrew his resolution, and in place thereof offered the following:

Resolved, That the matter of the communication of E. W. Carritt, of the Metropolitan Telephone and Telegraph Company, addressed to W. H. Eckert, General Manager of that Company, presented to this Board for its action, be referred to the Expert to report on.

Unanimously adopted.

The Board here took up the consideration of numerous applications of the Metropolitan Telephone and Telegraph Company for individual telephone connections, and

Mayor Grant made the following statement:

"I have no objection to vote for them at all; but I want to call the Board's attention to the fact that a great number of these applications are granted without being submitted to me, and without a meeting of the Board."

Commissioner Gibbens: I think the Secretary sent some permits down to you for your consideration.

Mayor Grant: I never had any permits sent to me for my consideration since the last meeting of the Board.

Commissioner Gibbens: Mr. Wheeler reported to me that he had submitted some to you.

Commissioner Gibbens moved the following:

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company to stretch wires for individual telephonic connections, reported favorably on by the Expert as being in districts where there are no subways, be granted.

Unanimously adopted.

Commissioner Gibbens: I offer the following resolution:

Resolved, That the Electrical Expert be directed to furnish the Commissioner of Public Works with information regarding the locality of "dead" poles and wires of Electric Lighting Companies, as rapidly as possible, the Commissioner of Public Works is requested to remove the same as obstructions in the streets, inasmuch as it is not the intention of this Board to allow said "dead" lines of poles and wires to be again connected by any overhead wires. Also that a list of all the streets in which electric light wires still remain be furnished the Commissioner of Public Works wherein such wires are classified as follows:

- (a.) Not dangerous, and can be connected with subways or stations without overhead wire.
- (b.) Cannot be connected with stations or subways without stretching overhead wire.
- (c.) Dangerous if connected.

And to point out all dangerous and "dead" wires to the Commissioner of Public Works.

Unanimously adopted.

Commissioner Gibbens offered the following resolutions:

Resolved, That the usual notice of ninety days be sent to companies operating electrical conductors in the streets and avenues designated in the Report of the Electrical Expert as those wherein a sufficient accommodation for electrical conductors now overhead in underground subways exists.

Unanimously adopted.

Resolved, That the list of streets and avenues wherein poles and wires remain overhead which would otherwise be removed but for the service of the Fire and Police Departments, as contained in the Report of the Expert of the Board, be sent to the Commissioners of the Fire and Police Departments, with a request that said Departments still continue their co-operation with this Board, and will particularly endeavor to permit the removal of these lines, if possible without interference with the service of the Departments.

Unanimously adopted.

Resolved, That a committee of two be appointed by the Mayor to confer with the Telephone and Telegraph Companies relative to the removal of unnecessary lines of conductors belonging to said Company, as specified in the Report of the Electrical Expert, and that such committee report to this Board at its next meeting the result of such conference, and that the Mayor request the Commissioner of Public Works to act with such committee.

Unanimously adopted.

Mayor Grant appointed Commissioners Gibbens and Hess as the committee of two.

Resolved, That the Secretary be directed to request the State Civil Service Commission to examine candidates for the positions of three additional Inspectors of Electrical Conductors, and to certify the names of these applicants who are successful in passing the said examination to this Board at the earliest convenient date.

Unanimously adopted.

Mayor Grant: I understand the Electrical Expert recommends the appointment of the three additional inspectors—do you not?

Expert Wheeler: Yes, sir.

The last resolution was thereupon unanimously adopted.

Commissioner Gibbens: In connection with the resolution which has been adopted appointing a committee to confer with the telephone and telegraph companies, there is a communication from the Mayor's office transmitting a communication from the Commissioner of Public Works, containing a communication from Postal Telegraph-Cable Company, and I suggest that this be referred to that committee. It is simply in connection with the removal of unnecessary telegraph lines. They say they have not any.

Mayor Grant (to Commissioner Gilroy): There has been a committee appointed here—Mr. Gibbens and Mr. Hess—relative to the removal of unnecessary lines of telephone and telegraph conductors, and Mr. Gibbens has requested me to ask you to co-operate with that committee.

Commissioner Gilroy signified his assent to such co-operation.

Commissioner Gibbens: Mr. Chairman, the only other matter that is contained in the Report of the Expert are the modified rules and regulations; all these other recommendations have been acted upon, and in order that you may have an opportunity of looking over the rules and regulations and Report of the Engineer, and so on, I think it would be well if we set a day when we will decide on these matters; in the meantime send copies of these modified rules and regulations to the Electrical Companies so that they will have a chance to discuss them.

Mayor Grant: Do you make that motion?

Commissioner Gibbens stated that he made such a motion, and
The Board adopted it by a unanimous vote.

Adjourned, subject to the call of the Chair.

APPENDIX TO MINUTES OF MEETING OF JANUARY 8, 1890.

THIRD REPORT OF THE BOARD OF ELECTRICAL CONTROL IN AND FOR
THE CITY OF NEW YORK—ADOPTED JANUARY 8, 1890

To the HON. DAVID B. HILL, Governor of the State of New York, and the Members
of the Legislature:

GENTLEMEN:—The First Report of the Board of Electrical Control submitted to
you two years ago described the situation of affairs connected with the electrical con-
ductors in the city of New York as follows:

“THE PRESENT SITUATION.

“A Commission of four members, one of them being the Mayor of the city, ex-
officio, is constituted, with full authority over all the electrical conductors in the city of
New York, and with the special ministerial duty of changing the present overhead sys-
tem to underground systems by the providing of subways suitable for occupancy by
the companies doing business at present with overhead conductors.

“A Construction Company (the Consolidated Telegraph and Electrical Subway
Company) is authorized to construct the subways designed by the Commission, and to
permit the use of them by electrical companies upon fair and impartial terms.

“Over the excavations of this Construction Company in the streets, the local au-
thorities, represented by the Commissioner of Public Works, have full control.

“Its profits are limited to ten per cent. on the money actually invested by it in car-
rying out the directions of the Commission—the excess going to the city; and to all its
books and accounts the local authorities, represented by the Comptroller, have access.

“A provision of law makes it incumbent upon the Board to give to companies
operating conductors overhead ninety (90) days of notice for the removal of their
overhead wires after a sufficient construction of subways has been made ready in any
street or locality, reference being had to the general direction of the wires in use; and
in the event of the companies so notified not removing their poles and wires from the
street before the expiration of the ninety days of notice, it is provided that the local
authorities shall thereupon remove them.

“This state of affairs would seem to be admirably adapted for the fulfillment of the
task imposed upon the Board.”

Notwithstanding the confidence which was expressed in that previous communica-
tion to you, two years have elapsed without the complete removal of the poles and wires
from the streets of this city.

The division of responsibility between the Board and the local authorities, as stated above, has not proved as successful and effective as was expected; and delay in building subways and unpunished hostilities on the part of the electrical companies have been its result to such an extent that it is but recently that any satisfactory progress has been made in the removal of the poles and wires from the surface of the streets.

The struggle between the electrical companies and the popular demand that electrical conductors shall be operated in cities underground, covers a period of many years, being a greater period than the existence of many of the electrical companies now doing business in the city of New York. It was begun by the different telegraph companies spreading themselves over the city and through the various streets and avenues without regard to the convenience of the public and the other uses to which the streets are subject.

1875—THE BEGINNING OF THE CONTEST—TO 1884.

In or about the year 1875 a bill was introduced into the State Legislature for the purpose of compelling corporations operating electrical conductors to place them underground. This bill was met on the part of the electrical companies then in existence by the claim that such action on their part would be impossible. Every succeeding year the same or similar measures were introduced, receiving more and more public support as the question became more and more agitated, but always meeting with the same opposition on the part of the electrical companies, until, in 1884, the Legislature did finally enact a law to the effect that the wires must go underground, and that, in case they were not placed underground within a certain limited period, the local authorities could remove them absolutely from the streets.

To this command the electrical companies answered nothing, apparently taking no notice whatever of its provisions.

1885 TO 1887.

At the succeeding session of the Legislature in 1885, a supplementary measure was passed providing for the appointment of a Board of Commissioners of Electrical Subways. This measure substantially declared that the electrical companies should be allowed sixty days, after the appointment and organization of such Board, to present plans for placing their wires underground themselves, and, in case such plans should not be presented or approved by the Board, the Board of Electrical Subways should adopt a plan and construct electrical subways and compel the use thereof by the electrical companies.

NO POWER TO ENFORCE THE ACT OF 1885.

No provision was made in this act giving the Board of Commissioners of Electrical Subways the right to enforce the occupancy of subways constructed under its plans, or of enforcing any of the much-desired changes in the overhead service until the subways should be occupied.

The companies were advised by counsel on these points, and, as was consistent with their past actions and also with their subsequent course, they submitted no plans for placing their own wires underground, and virtually defied the orders of the Board, of whatever description.

FIRST BUILDING OF SUBWAYS.

Notwithstanding this attitude of these corporations, the Board of Electrical Subways proceeded, under the advice of the Attorney-General, to construct some subways, in order to test the validity of the statute and force the question of the obedience of the companies to the will of the people to an issue.

Meanwhile, one of the electrical companies—the Metropolitan Telephone Company—became convinced that the enormous extension of its business required greater facilities than those secured by overhead wires, and arrived at the conclusion that some subways were necessary.

This fact gave an impetus to the question of subways for electrical conductors, and many plans for subways were submitted to the Board of Commissioners of Electrical Subways by experts upon the subject, each of whom claimed that his plan and his patent were the only ones by which the business could be done. In all, some 450 of these different devices were submitted, and the attention of the Board, for many months after the sixty days allowing companies to bury their own wires had expired, was devoted to the consideration of the claims made by the rival patentees.

It was finally decided that no patents were necessary, but that the way to build subways was to provide a protection for insulated wires underground which would require the least disturbance of the streets and afford the greatest convenience for placing the wires therein, and the greatest protection from the influences to which underground construction is subject.

Subways were constructed and the electrical companies were invited to occupy them; but, maintaining the attitude which they had formerly displayed, they refused to do so, except in the single instance of the Telephone Company, and the Board of Commissioners of Electrical Subways was powerless to compel them.

THE ACT DECLARED VOID.

Meanwhile, claims of disappointed patentees resulted in the decision of one of the judges of the Court of Common Pleas, that the law and the action of the Board under it were improper or unconstitutional, and it became necessary to again appeal to the representatives of the people for a more decided and more serviceable weapon with which to attack the law-defying corporations which threatened to destroy the safety and comfort of the citizens of New York.

THE ACT OF 1887.

The result of the further appeal to the Legislature was the passage of the Act of 1887, which constituted the Board of Electrical Control.

This Act may be divided into two parts. The first part relates to the building of subways and placing the wires therein, and the removal of poles after the subways are built. And the second part relates to the regulation of overhead wires until subways are provided, so that the lives and property and comfort of the citizens of New York may be preserved during the time necessary for the construction of adequate accommodations underground.

The act contained no provision by which the Board of Electrical Control could enforce its intent. The enforcement of the first part of the act—that part which related

to the occupancy of the subways—was left in the exclusive jurisdiction of the Mayor of the City of New York. The second part—that part which related to the regulation of the poles and wires until the subway should be completed—could only be enforced by a presumption founded on the fact that there are certain authorities charged with the abatement of public nuisances, and every unauthorized pole or wire, and every pole or wire not in accordance with the rules and regulations of the Board of Electrical Control, may be held to be a nuisance.

A DUAL RESPONSIBILITY.

It will be seen, therefore, that the responsibility for the condition of the wires in the city of New York under the Act of 1887, is a dual one. The providing of subways and the making of rules and regulations for the overhead wires, as well as the underground wires, is the part and duty of the Board of Electrical Control; while the forcing of the companies to occupy the subways, and the enforcement of the rules and regulations of the Board of Electrical Control, after such rules and regulations are promulgated, is the part and duty, not of the Board of Electrical Control, but of certain local authorities, to wit: the Mayor, in the first instance, and the Commissioner of Public Works, in the second.

But the Board of Electrical Control, after the passage of the Act of 1887, and after its organization in June of that year, did not anticipate serious trouble from the dual responsibility to which I have referred. It presumed that the electrical companies which had so long opposed the law would at last see the necessity of a compliance therewith. It presumed that the local authorities to whom was intrusted the enforcement of the law would proceed vigorously to compel the occupancy of subways and the proper enforcement of rules and regulations of overhead wires until such subways were completed.

1887 TO 1889.

This confidence was doomed to be rudely dispelled. The electrical companies still maintained that it was utterly impossible for them to operate their wires underground, and insisted that underground subways for electrical conductors were absolute impossibilities, and that they could never be successfully operated.

As to the rules and regulations of the Board of Electrical Control, to them they paid practically no attention whatever.

The Board of Electrical Control built subways. The Board of Electrical Control importuned the then Mayor of the City of New York to compel the occupancy of the subways. The Board of Electrical Control urged the then Commissioner of Public Works to see that the rules and regulations of the Board were enforced. But the apathy of the authorities and the misrepresentation of the electrical companies were too much for the Board, and for nearly two years all that it could accomplish was by arranging with the companies that if they would go underground in such and such places they might go overhead in such and such other places; and it was only by such means as this that anything whatever was accomplished.

As it was, very little was accomplished. No poles to any great extent were removed. No wires except those of the Telephone Company were placed in the subways. The rules and regulations of the Board for overhead conductors were not enforced. And the corporations still insisted that the Board and its work were failures, because those who were charged with the duty of enforcing its decrees—to wit, the Mayor and other city authorities who alone had the power—would not do so.

1889.

This brings us up to the last period in the history of this singular contest. On the 1st of January, 1889, a new administration of the local government, pledged to carrying out the law with relation to electrical conductors, was inaugurated in this city. But the companies still claimed that it was utterly impossible to operate wires underground; they still refused to abide by the rules and regulations made by the Board of Electrical Control; and when it became apparent that the Mayor of the City of New York and the Commissioner of Public Works were preparing to enforce the acts relating to their business they proceeded to procure injunctions restraining such action.

The telegraph companies went to the United States Court, and some of the electrical light companies went to the State Court. In the suits they instituted they declared that it was utterly impossible to operate electrical conductors underground; that the Board of Electrical Control was a stupid and vicious body; that it did not understand the work for which it was constituted and which it had been directed to do; and that to abide by its decrees, and rules and regulations which it made, was to utterly destroy their business. The determination of these suits was had on February 6, and April 12, 1889.

TRIUMPH OF LAW AS TO SUBWAYS.

Then for the first time was an electrical company in the city of New York seriously subjected to the operation of the law.

Notwithstanding the contest which has been going on, the work of the Board has at no time been discontinued.

THE WORK OF THE BOARD.

The following table shows the construction of subways to date:

Service.	Miles Trench.	Miles Duct.
Telephone and Telegraph.....	28	503
Electric Light	29	454
Edison	16	50
Subsidiaries		10
Total	73	1,017

This construction will accommodate approximately 45,000 miles of telephone and telegraph wires and 2,000 miles of electric light wires.

The streets and avenues on which subways for telephone and telegraph conductors have been laid, are the following:

Broadway, from Bowling Green to 58th street.
 New Church street, from Exchange Alley to Barclay street.
 Barclay street, from Church to West street.
 College place, from Barclay to Chambers street.
 West Broadway, from Chambers to Canal street.
 South Fifth avenue, from Canal to 4th street.
 4th street, from South Fifth to Sixth avenue.
 Sixth avenue, from 4th to 58th street.

Eighth avenue, from 42d to 58th street.
 Madison avenue, from 23d to 59th street.
 Lexington avenue, from 58th to 79th street.
 Spring street, from Broadway to West street.
 Houston street, from Broadway to Chrystie street.
 Houston street, from Greene to Bedford street.
 18th street, from First to Seventh avenue.
 23d street, from Broadway to Madison avenue.
 38th street, from First to Eighth avenue.
 42d street, from Broadway to Madison avenue.
 45th street, from Vanderbilt to Eighth avenue.
 58th street, from Third to Tenth avenue.
 Battery place, from Greenwich street to Bowling Green, along Bowling Green to
 Whitehall street, along Whitehall to Pearl street.
 Stone street, from Whitehall street to Hanover Square.
 Broad street, from Water street to Exchange place.
 Exchange place, from Broad to New Church street.
 William street, from Exchange place to Front street.
 Front, from Exchange place to Gouverneur street.
 Pearl street, from Hanover Square to Beaver street.
 Maiden lane, from Front street to Broadway and Cortlandt, along Cortlandt to
 West street.
 John street, from Broadway to Front street.
 Nassau street, from John to Ann street, along Ann to Gold street, along Gold to
 Beekman street.
 Frankfort street, from Park place to Pearl street.
 Park Row, from Ann to New Chambers street.
 Centre street, from Reade to Grand street, Worth from Chatham Square to Hudson
 and New Bowery to Chambers street.
 Dey street, from Broadway to West street.
 Hudson street, from Worth to Canal.
 Murray street, from Broadway to College place.
 79th street, from First to Fourth avenue.
 Cedar street, from West to Church.
 Tenth avenue, from 58th to 59th street.
 Wall street, from Nassau to Pearl.

The streets and avenues on which subways for lighting and power conductors have been laid are the following:

Sixth avenue, from 14th to 59th street.
 Broadway, from 58th street to Battery.
 19th street, from Broadway to Fifth avenue, and from Fifth to Sixth avenue.
 21st street, from Broadway to Fifth avenue.
 23d street, from Fourth to Eleventh avenue.
 24th street, from Broadway to Sixth avenue.
 25th street, from Broadway to Sixth avenue.
 26th street, from Broadway to Sixth avenue.
 27th street, from Madison to Broadway, and Broadway to Sixth avenue.
 28th street, from Fifth to Eighth avenue.
 125th street, from Second to Eighth avenue.
 29th street, from First avenue to Broadway.

42d street, from First avenue to Broadway.
50th street, from First avenue to Broadway.
Seventh avenue, from 45th to 58th street.
Eighth avenue, from 45th to 50th street.
Washington street, from Cortlandt to Fulton street.
Fulton street, from Washington to Broadway.
Houston street, from First avenue to Hancock street.
Bowery, from Chatham Square to 6th street.
Third avenue, from 6th to 130th street.
14th street, from First avenue to Sixth avenue.
22d street, from Broadway to Fourth avenue.
Eleventh avenue, from 23d to 24th street.
24th street, from Eleventh to Twelfth avenue.

The streets and avenues on which the conductors of the Edison Illuminating Company have been laid for incandescent lighting are the following:

18th street, from Broadway to Sixth avenue.
19th street, from Broadway to Sixth avenue.
20th street, from Broadway to Fifth avenue.
21st street, from Broadway to Sixth avenue.
23d street, from Fourth to Seventh avenue.
24th street, from Broadway to Sixth avenue.
26th street, from Fifth to Sixth avenue.
27th street, from Fifth to Sixth avenue.
29th street from Fifth to Sixth avenue.
30th street, from Fifth to Sixth avenue.
31st street, from Fifth to Sixth avenue.
32d street, from Fifth to Sixth avenue.
33d street, from Fifth avenue to Broadway.
34th street, from Fifth to Sixth avenue.
35th street, from Fifth to Sixth avenue.
36th street, from Third to Sixth avenue.
37th street, from Fourth to Sixth avenue.
38th street, from Fourth to Sixth avenue.
39th street, from Fifth avenue to Broadway.
40th street, from Fifth avenue to Broadway.
42d street, from Fifth avenue to Broadway.
Fourth avenue, from 36th to 38th street.
Broadway, from 14th to 45th street.
Sixth avenue, from 18th to 50th street.
Madison avenue, from 23d to 50th street.
14th street, from First to Seventh avenue.
16th street, from Sixth avenue to Union Square.
22d street, from Fourth to Lexington avenue.
25th street, from Broadway to Sixth avenue.
28th street, from Fifth to Sixth avenue.
47th street, from Madison to Sixth avenue.
48th street, from Madison to Sixth avenue.
53d street, from Madison to Sixth avenue.
54th street, from Madison to Sixth avenue.

THE REMOVAL OF POLES AND WIRES.

On all these streets and avenues the companies whose wires have been provided for have been directed to remove their poles and wires from the surface within ninety days, and at the expiration of that time, in case they are not so removed, it becomes possible and proper for the local authorities to remove them forthwith.

As has been stated, no removals were made under this provision of the act up to a very recent date, by reason of the apathy of the local authorities and the lack of co-operation on the part of the chief executive officer of this city until the beginning of the year 1889, and subsequent to that, owing to the injunctions procured by certain of the electrical companies.

The following table shows the poles and wires which have been removed as the result of work of the Board, either by the companies or by the Bureau of Incumbrances of the Department of Public Works:

	No. of Poles.	Miles Wire.
By Companies	1765	2788
By Dept. of Public Works.....	3007	2827
Total	4772	5615

SUBWAYS AND UNDERGROUND CONDUCTORS.

The following table shows the number of miles of electrical conductors now in the subways, and the companies by which they are owned or operated:

Name of Company.	Number of Miles of Underground Wire.
Metropolitan Telephone	10,906
Western Union	578
Postal Telegraph	35
United States Illuminating.....	88
Brush Electric Light	38
Manhattan Electric Light	67
Harlem Electric Light	10
Mt. Morris	2
Edison	252
N. Y. Fire Dept.....	332
Total	12,308 miles.

In addition to this underground wire some 2,000 miles of telegraph wire are being operated in cables on the elevated railroads under permits of the Board.

The principles which have been followed in inaugurating the underground system may be defined as follows:

First.—A conduit or subway for electrical conductors is nothing more than a mechanical protection for the wires within it, and a convenience for placing and protecting them underground.

Second.—Electric light and power conductors should, as a matter of precaution and not of necessity, be operated separately, and as far as possible from those for the transmission of currents of lesser intensity.

Third.—The material and form of the subway should depend largely upon the requirements of the locality and the service for which it is designed.

Fourth.—Drawing-in-and-out conduits with convenient manholes are, in the main, the most desirable for the streets of this city, where a condition of the law allowing the companies ninety days to place their conductors in the subways after they are constructed, necessitates that the subways shall be easily accessible without serious disturbance of the pavement.

Fifth.—The success of the underground service depends largely upon the proper insulation of the wires, and the largest liberty compatible with the preservation of the rights of others should be allowed to the companies making use of the subways.

Sixth.—The nature of local connections depend to a great extent upon the service and locality for which they are designed, and here, again, the liberty of choice under proper restrictions may reasonably be allowed.

Proceeding from these general principles, the Board has constructed subways in different localities largely differing in design, size and material; and time and experience only serve to strengthen the Board in its convictions and confirm its conclusions as correct.

In order that the statements contained above as to the sufficiency of the subways already constructed under the direction of the Board of Electrical Control may be substantiated by sworn testimony of those competent to judge of matters of this kind, affidavits are appended (See Appendix V.), sworn to by Mr. J. P. Barrett, the City Electrician of Chicago; Mr. J. Elliott Smith, the Superintendent of the New York City Fire Department Telegraphs; Mr. Sunny, President of the Consolidated Arc Lighting Company of Chicago, and others; showing that the provisions for underground electrical conductors in the City of New York represent the best and most complete knowledge and experience of the subject.

EFFECT OF ESCAPING STEAM.

In a portion of the city, where the Steam Heating Company maintains an imperfect construction and allows steam to escape in large quantities from its pipes, serious damage to the electrical conductors in the subways has been caused.

This has been made the ground of an attack upon the system of subways laid in this city, and opponents of underground wires have not hesitated to assert that, because of this impairment of the efficiency of the cables where the steam was allowed to escape into the streets, the entire construction of conduits for electrical conductors is a failure.

It might with equal justice be asserted that the entire system of railroad construction of the country is a failure because it is damaged in certain places at certain times in the year, by floods, landslides or forest fires; or that the system of street railways in our city is a failure because at times passengers are prevented from traveling along them, by reason of fires, processions or accidents on the route.

It is not a normal state of affairs in any city to have the sub-soil of the streets filled with free steam; but, on the contrary, the escape of steam from the pipes of the Steam Heating Company must be prevented by that Company in the interest of

all the citizens. This escaping steam will destroy pavements and the foundations of buildings, and do other damage, as well as the injury it does to the insulation of the underground conductors.

The Steam Heating Company is at present endeavoring to stop this escape of steam from its pipes in the localities referred to, and has expended up to the present time more than a quarter million dollars in repairs of defective construction. Should it succeed in remedying the defects, the subways in the locality will again be effective. Otherwise the Steam Heating Company must either rebuild or cease from using this section of its plant.

In other localities of the city where the construction of the Steam Heating Company is proper, and steam does not escape, the existence of the steam pipes in the same streets with the underground wires has no effect upon the latter.

The frequent explosions of illuminating gas escaping from leaky mains into subways, sewers and house-vaults, is a matter which requires attention. A full report of this subject will be found in the appendix.

ELECTRICAL CONNECTIONS.

In the matter of making electrical connections with the subways when constructed, the Board does not see good reason for departing from its original position of allowing the Construction Company to furnish whatever the several companies desire for themselves from the manholes to the points desired to be reached.

As soon as subways are prepared along any street or avenue "sufficient in the opinion of the Board, reference being had to the general direction of the wires in use overhead," for the accommodation of the different electrical service, a notice is sent to the company operating such wires (see appendix).

The way in which this resolution is drawn practically allows the companies operating wires to select their own methods of local distribution, while, at the same time, the authority of the Commission over the Construction Company and its work, as well as the supervision of the Construction Company itself over the underground accommodations, is preserved.

This plan has been taken advantage of by some of the companies, and promises beneficial results. For example, the Construction Company has in some instances employed the hand-hole system of distribution for the use of telephone wires in downtown streets where it seemed desirable; while at other points a single entrance into a block, in connection with housetop distribution, has proved sufficient. Again, in portions of the city where it seemed desirable, and where companies have requested it, the hand-hole system of distribution for electric lights has been provided, while in other streets where no local distribution is needed, accommodation for trunk lines only is considered sufficient.

One result of the liberality shown to the electrical companies in the matter of making electrical connections—which appears to be in entire harmony with the spirit of the laws relating to electrical conductors—is to be found in the unfair criticism of the Board by those who are opposed to its work, and the false statement that the Board has no mode of distribution from the subways.

If the Board had adopted or approved one single system of distributing electrical conductors from the subways to the exclusion of all other methods, it would have been impossible for this unjust criticism to be made; but inasmuch as there are several modes of distribution equally applicable to the general subway system, and each of which has its own peculiar advantages for certain locations and certain electrical service, it would be absurd for the Board to proceed in an unphilosophic manner merely to avoid criticism.

The language of the Act quoted above taken in connection with other words in the same—(Chapter 716 of the Laws of 1887) "The said Board shall notify the owners or operators of the electrical conductors above ground to make such electrical connections as shall be determined by the said Board"—plainly invests the said Board with discretion; and it was intended by the Legislature that the discretion vested in the Board of Electrical Control should be exercised and not abandoned.

To permit the various companies each to select its choice from among the many modes of distribution, and then to determine whether or no the choice is proper, and, if such choice be not proper or be not made, to prescribe a method, is not only entirely within the limits of authority of the Board, but for the direct benefit of the electrical companies as well.

Diagrams showing different methods of distribution are appended.

THE CONDITION OF THE WIRES OVERHEAD.

The great need of improvement in the condition of the overhead wires induced the Board to ask for an appropriation sufficient to enable it to employ inspectors who should be competent to investigate and report cases of improper construction and maintenance of the overhead service. As soon as this appropriation became available an electrical expert and inspectors were appointed, and since that time this work has received their entire attention.

It is found that the condition of the overhead wires in the city is very bad. The rules and regulations of the Board of Electrical Control are violated everywhere. Unnecessary and "dead" poles and wires make up from thirty to fifty per cent. of all those existing. The poles made use of and the method of construction, as well as the way in which the wires are strung, are not in accordance with proper principles, nor in harmony with the character of the buildings along the streets, nor of a description enabling the freest possible use of the streets for other purposes.

On the contrary, the wires are almost uniformly dangerous, especially those devoted to the electric light service. They obstruct the Fire Department; the poles are found duplicated by other lines alongside of them where one line would be ample for the business of both. The wires cross streets and enter buildings irregularly, instead of at right angles as they should; the poles are crooked, unpainted, different in size and shape; the cross-arms upon them are irregular, and the entire construction is unsightly and improper.

The Board has adopted a few general and easily comprehended rules and regulations for overhead wires, which if followed, would relieve the overhead service from the danger and unnecessary obstruction which now attend it. (See Appendix IV.)

Notwithstanding the simplicity and propriety of these rules and regulations, violations are constantly being reported to the Board by its corps of inspectors.

The total number of cases of violations of the rules and regulations of the Board reported since this system of inspection was inaugurated, is 7,046.

Upon reports of this character being received at the office of the Board, notices are sent to the companies whose poles and wires violate the rules and regulations. In case the proper changes are not made by the company themselves, notices are sent to the Department of Public Works for the removal of the offending structure.

The total number of notices sent is 3,195.

It would be difficult to overestimate the importance of this work of supervising and controlling the overhead electrical conductors in the city.

The general principles which has governed the Board in its dealing with the question are as follows:

First. All useless poles and wire must be removed from the streets.

Second. All dangerous currents must be carried on insulated wires, and the insulation must be maintained.

Third. All poles must be of a sufficient size to keep the wires away from the sidewalk, sufficient to allow unobstructed operations by firemen.

Fourth. One line of poles for each class of wires is enough in any street or avenue: and the telephone and telegraph wires must be kept on the opposite side of the street from those devoted to electric lighting.

Fifth. All the construction of poles and wires should be symmetrical, uniform and safe.

Following these principles, the Board has held that wherever any company received permission to erect a line of poles and construct a line of overhead wires, it must allow its poles to be used by any other company desiring to do so, and offering proper compensation.

The carrying out of this method in all the streets of the city where there are no subways would be of the greatest benefit to the streets, and would enable all electrical companies to operate freely in any part of the city, thereby insuring the best service at the cheapest rate to the public, without the duplication or multiplication of pole lines.

The question of operating electrical conductors in the subways successfully, as has been shown, has been thoroughly demonstrated, and every effort has been made to compel a proper condition of the overhead wires until subways shall be prepared throughout the city.

But while the wires are going underground, and are being regulated when underground—and it is an easier matter to regulate them there than elsewhere, and the control is better assured—the opposition to law displayed by the electrical companies in the past is still to be observed in their refusal to properly take care of their overhead wires.

CONTINUED OPPOSITION OVERHEAD.

As an instance of the utter recklessness and carelessness of the companies, they have in every possible case, except where they could gain or save something, thrown upon the city the burden and expense of removing the poles and wires which were unnecessary to them longer, and in place of taking down "dead" wires, which are constant menaces to life and property, they are in the habit of allowing them to remain until the small force at the disposal of the Board of Electrical Control has located them, and then of either removing them themselves, to save the wires, or, if the wires are not worth saving, to take no notice of the regulations of the Board and let the dangerous wires and poles remain until the Commissioner of Public Works can get to them.

FINAL ACTION OF THE BOARD.

Owing to the disregard of the notices sent out by the Board of Electrical Control as to the dangerous condition of the overhead wires, and owing to the constantly increasing dangers from wires which did not conform to the Rules and Regulations, the Board of Electrical Control, on Wednesday, the 9th of October, passed a resolution to the effect that thereafter no more dangerous currents should be operated on improperly insulated wires until said wires had been certified by the expert of the Board to be in good condition.

The resolution passed on Wednesday was served on the companies on the following Thursday; and in spite of its being in the interest of the public for the Board of Electrical Control to give such direction, such badly insulated circuits were in operation on Thursday and Friday.

On Saturday, the 12th of October, an attempt was made by the Commissioner of Public Works to enforce the resolution and the Rules and Regulations of the Board by taking down the dangerous and badly insulated wires, but this intention was frustrated by an injunction granted by Mr. Justice Andrews of the Supreme Court.

Having procured this injunction upon allegations to the effect that their wires were in good condition, and that they were under constant inspection by competent men, the companies proceeded to operate defective circuits and circuits which they had merely made a pretence of making safe.

Then followed a series of shocking accidents to life, which aroused the community to a sense of the dangers of the electrical service and the necessity for its being conducted under the most careful scrutiny by disinterested officials, and the enforcement of all the well-recognized principles of safety in the maintenance of the lines of conductors and the distribution of electric current.

Nothing could be done to remedy the evils, however, until the 13th of December, when the injunction referred to was vacated by the General Term, and since that time the removal of dangerous poles, wires and fixtures has been pushed with vigor and determination by the Department of Public Works.

The mistaken course of the electrical companies in refusing to care for their overhead wires, because the time was not far distant when they would be obliged to abandon them for underground wires, has caused suffering and death, and plunged the City of New York into temporary darkness. But the triumph of law is secured at last, and its majesty has been vindicated.

GENERAL RECOMMENDATIONS.

The experience of the past, shows the necessity in the future for the most rigorous inspection of subways and wires within them, and of such overhead lines as still exist until such time as subways shall be provided, and it is respectfully recommended that provision be made under which some one department, or official, or board, shall be vested with full power over the whole subject of electricity, and that the responsibility which has heretofore been divided, to the serious detriment of the public interest at times, should be consolidated.

In view of the frequent and constantly increasing dangers from other underground construction in this city than that for electrical conductors, and in view of the fact that a comprehensive system of subways which should include the pipes of the steam, gas and other companies, as well as the cables for traction and the electrical wires from which connections could be made to buildings without the removal of the pavements, seems to be required by the exigencies of the situation. It is also suggested that full power to cause the construction of such a comprehensive system of subways or sub-streets might well be vested in some official or official board at this time.

It is further suggested that whenever the Department of Public Works is called upon to remove defective poles and wires, or those provided for underground, the expense of the work of removal shall be borne by the electrical companies owning the defective or unnecessary lines.

All of which is very respectfully submitted.

For the Board,

(Signed),

THEO. MOSS, Secretary.

APPENDIX VIII.

REPORT OF THE ELECTRICAL EXPERT.

NEW YORK, January 6th, 1890.

To the Board of Electrical Control.

GENTLEMEN:—I have to report, from information furnished, the following are the companies operating electrical conductors underground, with the mileage of wire operated by each:

Metropolitan Telephone and Telegraph Company.....	10,906	miles.
Western Union Telegraph Company.....	578	"
Postal Telegraph Company	35	"
United States Illuminating Company.....	88	"
Brush Electric Illuminating Company.....	38	"
Manhattan Electric Light Company.....	67	"
Harlem Lighting Company.....	10	"
Mount Morris Electric Light Company.....	2	"
Edison Electric Illuminating Company.....	252	"
New York City Fire Telegraph.....	332	"
Total miles.....	12,308	"

The results of the use of the underground conductors in the subways are very satisfactory. The tests of the conductors used for high tension currents shows that there is no deterioration perceptible in the cables by reason of such use, as they have been subjected to, in some instances, for six months. Whenever imperfections in the underground circuits have been ascertained as existing, by the tests furnished by the companies, they have proved due to bad workmanship in making joints and connections, or the exposure of the ends of cables to the weather.

Three of the Companies have been negligent in furnishing tests of underground conductors,

The Edison Company,
The Brush Company,
The Western Union Company.

It is recommended that the Subway rules be modified so as to enable the Construction Company to compel action by the Companies in this respect. Otherwise serious trouble may result in the future. The Electric Light Circuits must be closely watched and full power to deal with them given if accidents are to be insured against.

The condition of the overhead wires is still very unsatisfactory. The recent action of the Commissioner of Public Works, under the ruling of the General Term, has disposed of much of the dangerous electric light construction which existed in the city. There remains, however, an immense amount of unnecessary and improper electrical construction.

This may be divided as follows:

First. Lines of electric light conductors which have been "cut dead," and which should either be fixed up, in accordance with the rules and regulations, and connected with the stations, or, in case the Board does not permit this to be done, should be removed as useless and unnecessary obstructions of the streets. A list of many of these lines is herewith submitted, so that the Board may take immediate action with reference to this matter.

WIRES CUT OFF FROM STATIONS.

148th street, from Third avenue to 170th street and Third avenue. N. N. Y. Ill. Co.
Spring street and South Fifth avenue. East River wires.
Centre street, from Grand to Chambers. East River on tel. poles.
Greene and Bleecker streets, south. U. S. Line.
44th street, from Depew avenue to 48th street, Fourth avenue. U. S.
44th to 42d street, Depew avenue. U. S.
46th street, from Tenth avenue to North River.
138th street, Third avenue to Harlem Bridge. N. N. Y. Ill Co.

A further list is here given of lines which, though at present cut dead, extend at one or more points to localities where there are subways and which, therefore, can be used by connecting them to cables in the existing subways.

WIRES CUT OFF FROM STATIONS, BUT REACHING SUBWAYS.

44th street, from Eighth avenue to Ninth avenue. Brush.
13th street, from Fourth avenue to Sixth avenue. East River.

- 55th street, from Third avenue to Eighth avenue, to 53d street. U. S.
- 42d street, from Depew avenue, to Vanderbilt avenue, to 43d street, to Sixth avenue. U. S.
- Eighth avenue, from 43d to 53d streets. U. S.
- 35th street, from Broadway to Eighth avenue. U. S.
- 50th street, from Broadway to Eighth avenue. Brush.

Also certain wires on following streets which were disconnected by taking down the Broadway line.

- 8th street, East and West from Broadway. Brush.
- Canal street, East from Broadway. Brush.
- Franklin street, East from Broadway. Brush.
- Thomas street, West from Broadway. Brush.
- Worth street, West from Broadway. Brush.
- Prince street, from Broadway to Crosby.
- Bleecker street, from Broadway to Eighth avenue.
- White street, from Broadway, West. Brush.

Second. The telegraph companies of this city, through a process of consolidation of old companies and their absorption by stronger ones, occupy almost all of the streets and avenues of the city with pole lines, in some places having more than one pole line on the same street. In view of the fact that the Western Union Telegraph Company is provided with facilities, under permits of the Board of Electrical Control, north and south throughout the entire city, on both sides, on the Elevated Railroad structures, and east and west on pole lines which have been allowed by the Board to be connected to the cables on the Elevated, and also with accommodations in subways in certain cross town streets, the entire lines of the Western Union running north and south now carried on poles seem to be absolutely unnecessary. The removal of these lines would relieve the streets of the city of an immense number of poles and an immense mileage of wire and greatly increase the safety of life and property, as well as permit the free use of the streets for other purposes. I am informed that the report of the Engineer contemplates provision underground for the crosstown lines of this company. A list of the lines of the Western Union is herewith appended, and it is recommended action be taken by the Board at the earliest possible moment to relieve the city of these obstructions.

WESTERN UNION TELEGRAPH CO.

DUPLICATE LINES.

- Eleventh avenue, from 51st to 41st streets.
- Tenth avenue, from 37th to 16th streets.
- Ninth avenue, from 16th to 13th, and Gansevoort streets.
- Eighth avenue, from 42d to 13th streets, and on Greenwich avenue, Waverly place and 8th to Macdougall streets.
- Fourth avenue, from 55th to 45th streets.
- Washington street, from Gansevoort to Dey streets.
- South Fifth avenue and West Broadway, from Prince to Chambers streets.
- Greene street, from Waverly place to Bleecker street.
- Church street, from Canal to Rector streets.
- Mulberry street, from Bleecker to Canal streets.

33d street, from Lexington to Second avenues.
Bleecker street, from Greene to Mulberry streets.
Canal street, from Baxter to Mulberry streets.
Market street, from Division street to East Broadway.
William street, from Frankfort to Fulton streets.
John street, from Broadway to Front street.
Cedar street, from West to Church streets.
Pearl street, from Fulton to Broad streets.
Front street, from Fulton to Wall streets.
Broad street, from Wall to Stone streets.
Water street, from Broad to Old Slip.
Battery place, from West to Whitehall streets.

LINES PARALLEL AND THEREFORE UNNECESSARY.

Lines on the following avenues from 14th street up to be put on the Elevated:
Eleventh avenue, Tenth avenue, Ninth avenue, Eighth avenue, Seventh avenue,
Sixth avenue, Fourth avenue, Lexington avenue, Third avenue, Second avenue, First
avenue and Avenue C.

LINES IN FOLLOWING STREETS TO BE REDUCED TO TWO OR THREE MAIN CROSS LINES.

57th street, from Tenth to Eighth avenue.
55th street, from Hudson River to Fourth avenue.
54th street, from Lexington avenue to Avenue A.
51st street, from Hudson River to Eleventh avenue, and Seventh to Lexington
avenue.
46th street, from Eleventh to Second avenue.
45th street, from Fourth to Third avenue.
41st street, from Eleventh to Sixth avenue.
40th street, from Broadway to Second avenue.
37th street, from Eleventh to Tenth avenue.
35th street, from Seventh avenue to Broadway.
33d street, from Fourth to First avenue.
32d street, from Ninth to Seventh avenue, and Fourth to Second avenue.
20th street, from First avenue to Avenue C.
16th street, from Tenth to Ninth avenue.
15th street, from Tenth to Ninth avenue.

POINTS AT WHICH LINES RUN AROUND BOTH SIDES OF A CITY BLOCK.

Ninth avenue, Gansevoort and Hudson streets.
Greenwich avenue, Waverly place and Seventh avenue.
8th street, Waverly place, University place and Greene street.
5th street, First avenue, Second avenue and Houston street.
Bleecker, Prince and Macdougall streets and South Fifth avenue.
Baxter, Mulberry, Canal and Park streets.
Market, Henry and Madison streets.

PARALLEL LINES BELOW 14TH STREET, ON

West, Washington and Hudson streets.
 Bedford street, Bleecker street, Waverly place and Greenwich avenue.
 Mercer street, Greene street and South Fifth avenue.
 Elm, Centre, Mulberry, Chrystie, Forsyth, Baxter, Pearl and Market streets.
 East Broadway, Henry, Madison and Cherry streets.
 Murray and Barclay streets.
 Fulton, Dey, John, Liberty streets, Maiden lane and Cedar street.
 Front, Water, Pearl, Cliff, William and Beaver streets.
 Church and Broad streets.

The Telephone Company is provided with great facilities already in the subways. In many instances this Company has duplicate lines on the same streets, and lines in streets which are adjacent to other streets, having lines where such extra lines seem unnecessary. It is recommended that the Board take action in this respect. The list of duplicate and other lines seeming unnecessary is as follows:

METROPOLITAN TELEPHONE AND TELEGRAPH CO.

DUPLICATE LINES.

Second avenue, from 92d to 120th streets.
 Second avenue, from 40th to 32d streets.
 22d street, from First to Second avenues.
 Avenue B, from 19th to 15th streets.
 Avenue B, from 8th to 10th streets.
 Grand street, from Greene to Mercer streets, and from Broadway to Elm street.
 Water street, from Fulton to Jackson streets.
 Oak, Monroe and Roosevelt streets, from Water to Rutgers streets.
 Water street, from Broad street to Coenties Slip.
 Whitehall street, from Pearl to Bridge streets.
 Chambers street, from Centre to Chatham, and from William to Oak streets.
 Washington street, from Morris to Albany, and Cortlandt to Dey streets.
 4th street, from Grove to Cornelia streets.

POINTS AT WHICH LINES RUN AROUND BOTH SIDES OF A CITY
BLOCK.

Blocks bounded by State, Whitehall, Pearl and Bridge streets.
 Blocks bounded by Front, Water Coenties and Old Slip.
 Blocks bounded by Broadway, New, Beaver and Wall streets.
 Blocks bounded by Cortlandt, Dey, Washington and West streets.
 Blocks bounded by James, Roosevelt, Oak and South streets.
 Cortlandt, Albany, Washington and West streets.
 White, Franklin, Elm and Centre streets.
 Lispenard, Walker, Elm and Centre streets.
 Walker, White, Centre and Baxter streets.
 Houston, Stanton, Lewis and Mangin streets.
 125th and 124th streets, First avenue and Avenue A.

PARALLEL LINES ON ADJACENT OR NEARLY ADJACENT STREETS.

From Harlem River, south, on Fourth, Lexington, Third and Second avenues.

First avenue, Avenue A, Chrystie, Orchard and Clinton streets.

Pitt, Mangin and Tompkins streets and East Broadway.

20th and 19th streets, from Avenue A to Avenue B.

15th and 13th streets, from First avenue to Avenue D.

14th and 13th streets, from Second avenue to Avenue B.

14th and 13th streets, from Eleventh to Eighth ave.

13th and 12th streets, from Sixth to First ave.

21st and 19th streets, from Sixth ave. to Broadway.

27th and 25th streets, from Eleventh ave. to Hudson River.

11th and 13th aves., from 25th to 17th streets.

13th ave. and West street, from West 11th to 15th streets.

Greenwich ave. and West 4th street, from 13th to Christopher streets.

6th ave. and Christopher street, from Clinton pl. to 4th street.

Spring, Broome, Grand and Canal streets, from Varick to Marion.

South, Water, Front, Monroe, Madison, Henry, East Broadway and Division streets, at places from Corlears Hook to the Battery.

Oliver, James and Roosevelt streets, from Henry to South, Rose and Vandewater streets.

Elizabeth, Mott, Baxter, Centre, Elm and Crosby streets, from Bleecker to Chambers street.

In connection with the recommendation regarding the unnecessary telephone lines, a letter from the General Manager of the Telephone Company is submitted, and also correspondence with the Postal Telegraph Company relative to its unnecessary construction.

A proper manner of disposing of this entire subject would be to appoint a Committee of the Board to confer with the Companies, with power to report unnecessary lines to the Commissioner of Public Works for removal, in case such conference with the Companies is not satisfactory.

OFFICE OF THE GENERAL MANAGER OF

THE METROPOLITAN TELEPHONE AND TELEGRAPH CO.,

18 CORTLANDT STREET.

NEW YORK, Jan'y 2d, 1890.

DANIEL L. GIBBENS, ESQ., Board of Electrical Control, 1266 Broadway:

DEAR SIR:—Referring to our conversation of the 28th ult., in relation to certain streets in which we have pole lines, and where there are no subways, I beg to state that the Fulton street line between Broadway and South street can be removed within 30 days. The pole line in Cliff street, between Frankfort and Beekman streets, can be removed within 15 days.

The pole line on the west side of Second avenue, between 92d and 120th streets, can be removed within 30 days, providing we can transfer the wires to the east side of Second avenue between the above mentioned points.

In regard to the other streets mentioned in your list, I cannot at this time give you any definite information, but hope to be able to do so at an early date.

Yours very truly,

W. H. ECKERT, Gen'l Manager.

ALBERT B. CHANDLER, PRESIDENT.

POSTAL TELEGRAPH CABLE COMPANY,

WASHINGTON BUILDING, No. 1 BROADWAY.

NEW YORK, December 31st, 1889.

To the Board of Electrical Control, THEODORE MOSS, ESQ., Secretary, New York:

DEAR SIRS:—This company has to-day received from the Commissioner of Public Works a letter bearing yesterday's date, giving notice that all defective and unused telegraph poles and wires in New York City belonging to this company must be removed within ten days, and that in case of our failure to comply, the Department of Public Works will make seizure and removal of all such poles and wires. In connection with said letter, I beg to call your attention to my letter to you of December 11th, and beg also to state to you that this company has not received any notices from you that there are any poles and wires in the City of New York belonging to this company requiring attention or removal. As we understand it to be your rule, and also to be the requirement of the law, that ninety days' notice be given of the intention to remove any poles or wires belonging to a telegraph company after a subway has been provided, we assume that the notice from the Commissioner of Public Works is simply a formal one and not intended to affect our property. If we are mistaken in this respect, we have to request that in justice to us and yourselves you will please notify us of any poles and wires belonging to this company in the City of New York that do not come within the legal restriction.

I enclose for your information copy of reply made this day to the Commissioner of Public Works, and desire to say further to you that after the proposed inspection of our lines has been made, if we find any portions of our poles and wires that can be abandoned we will notify you so that such poles and wires can be removed either by you or ourselves. We desire to aid you in the carrying out of the law, but we must respectfully protest against any of this company's property being destroyed without proper notice and justification.

Very respectfully,

WM. H. BAKER, Vice-President.

ALBERT B. CHANDLER, PRESIDENT.

POSTAL TELEGRAPH-CABLE COMPANY,

WASHINGTON BUILDING, No. 1 BROADWAY.

NEW YORK, December 31st, 1889.

HON. THOS. F. GILROY, Commissioner of Public Works, New York City:

DEAR SIR:—In reply to your letter of the 30th instant giving notice that all defective and unused telegraph poles and wires in New York city belonging to this com-

pany must be removed within ten days and that in case of our failure to comply the Department of Public Works will make seizure and removal of such poles and wires, I beg to say that this company's poles and wires in New York City are all in first class condition. We have no defective or unused poles and wires. All wires have been removed by us as fast as their use has been discontinued.

I enclose you copy of our letter of December 11th to the Board of Electrical Control, for your information and as evidence to you that we have been giving the subject of our poles and wires in New York City very close and careful attention.

The fact that the Board of Electrical Control has not notified this company that it has any poles or wires in New York City requiring attention or removal in accordance with the rules and regulations, is also evidence that we have no such poles and wires as are referred to in your notice. We endeavor to comply with the rules and regulations of the Board of Electrical Control in every respect, and to use the greatest care in the proper maintenance of our poles and wires in New York City. I have ordered a new inspection to be made of all our lines, and if in any case we are able to put them in better shape than they now are or to reduce their number in any way by placing any of our wires in the subway or transferring them to other lines of poles, we will do so, and in such case will notify your Department.

In view of all the facts stated, we believe we are warranted in requesting you to give this company timely notice and an opportunity for a hearing in any case, where in the judgment of your Department, any poles or wires belonging to this company do not come within the requirements of the law. We have written also to the Board of Electrical Control, requesting that they give us proper notice of any poles or wires belonging to this company, which in their opinion, have no right to be maintained.

Very respectfully,

WM. H. BAKER, Vice-President.

Should these recommendations be followed out, I can assure the members of the Board that the condition of the electrical service in the city of New York will be greatly benefited. If the electrical companies will—as they have not in the past—assist the Board in this matter, substantial benefits will result; otherwise the Department of Public Works can be called upon to enforce the rules and regulations in respect to unnecessary lines.

The work of the Board of Electrical Control in relieving the streets of poles and wires would be greatly facilitated if more active co-operation on the part of the Fire and Police Departments could be had. It is impossible to remove lines which have been abandoned by the telephone and telegraph companies when the wires of the Fire and Police Departments remain; and, although in many instances, at the request of the Board, these wires have been removed, still many unnecessary lines exist which could be removed were the Fire and Police Department wires otherwise provided for.

The points where the removal of poles and wires abandoned by owners, or which are ready for removal under the Subway Acts, except for a few wires of the Fire and Police Departments, are the following:

POLES ABANDONED BY OWNERS NOW CARRYING FIRE AND POLICE
WIRES ONLY.

Ninth avenue, from 59th to 17th streets.
South Fifth avenue.

28th street, from Third to Sixth avenues.
 Leonard street, from Baxter to Hudson streets.
 Fourth avenue, from 58th to 79th streets.
 Third avenue, from 58th to 79th streets.
 79th street, from Fourth to First avenues.
 Lexington avenue, from 65th to 79th streets.
 Murray street, from Broadway to College place.
 Seventh avenue, from 11th to 51st streets.

POLES CARRYING OTHER WIRES, READY FOR REMOVAL, BUT CARRY-
 ING ALSO A FEW FIRE OR POLICE WIRES.

Seventh avenue, from 59th to 11th streets.
 Fourth avenue, from 79th street to Clinton place.
 39th street, from Eighth to Lexington avenues.
 Bleecker street, from Downing to Greene streets.
 Prince street, from Macdougall street to Bowery.
 Hester street, from Centre to Chrystie streets.
 Water street, from Wall to John streets, Postal Tel. line of dead poles, except
 fire wires.
 Pine street, from William to Water streets, forty-five dead wires on poles, carrying
 four fire wires.
 William street, east side, from John to Brooklyn Bridge, line of large poles carry-
 ing four fire wires.
 First street, from 1st to 4th avenues.
 Mercer street, from Clinton place to Canal street.
 Wooster street, from West 4th to Canal streets.
 Houston street, from Chrystie to Allen streets.
 Stone street, from Whitehall to Hanover square.
 Maiden lane, from Front street to Broadway.
 Cortlandt street, from Broadway to West street.
 Madison avenue, from 59th to 23d streets (3 poles).
 18th street, from 1st street to 7th avenue.
 8th avenue, from 58th to 42d streets.
 Spring street, from Greene to Bedford streets.
 Frankfort street, from Park Row to Pearl street.
 John street, from Nassau to Front streets.

With reference to the condition of the wires and the work of the Electrical De-
 partment, I submit a report of violations of the rules and regulations, showing the
 notices which have been sent to the Companies, etc.

REPORT OF ELECTRICAL EXPERT OF VIOLATIONS OF RULES FOR EIGHTEEN
MONTHS ENDING DECEMBER 31, 1889.

	No. of Violations.	Notices Sent.	Second Notices.	Notices Answered.	Notices Attended to.	Notices Sent to D. of I.
United States Co.						
Useless wires.....	428	257	122	185	96	124
Useless poles.....	191	72	37	8	12	48
Other violations.....	793	155	73	51	88	94
Total.....	1,412	484	232	244	196	266
Brush Co.						
Useless wires.....	83	56	19	37	31	13
Useless poles.....	108	43	11	17	16	11
Other violations.....	751	73	11	54	50	63
Total.....	942	172	41	108	97	87
East R. E. L. Co.						
Useless wires.....	16	14	13	7	5	..
Other violations.....	49	4	2	2	3	16
Total.....	65	18	15	9	8	16
Harlem Lt. Co.						
Useless wires.....	2	2	..	2	..	..
Other violations.....	5	1	..	1	..	3
Total.....	7	3	..	3	..	3
Ball E. L. Co.						
Useless wires.....	2	1	..	..	1	1
Other violations.....	3	1	..	..	3	2
Total.....	5	2	..	..	4	3
Mt. Morris Co.						
Useless wires.....	1	1	..	..	..	..
Useless poles.....	31	2	..	2	..	1
Other violations.....	70	1	..	1	..	11
Total.....	102	4	..	3	..	12
Manhattan E. L. Co.						
Useless wires.....	2	2	..	..	..	..
Daft E. P. Co.						
Dangerous wires.....	23	1	..	..	..	9
Met. Tel. & Tel. Co.						
Useless wires.....	850	244	10	180	59	4
Useless poles.....	264	19	4	9	9	8
Other violations.....	9	9	..	2	3	..
Total.....	1,123	272	14	191	71	12
W. U. Tel. Co.						
Useless wires.....	725	361	50	59	113	74
Useless poles.....	1,144	104	3	22	18	13
Other violations.....	20	20	..	5	..	..
Total.....	1,889	485	53	86	131	87

	No. of Violations.	Notices Sent.	Second Notices.	Notices Answered.	Notices Attended to.	Notices Sent to B. of L.
American Dist. T. Co.						
Useless wires.....	15	9	3	..	4	5
American U. Tel. Co.						
Useless wires.....	2	2	1	..	..	..
Useless poles.....	8	1	..	..	..	..
Total.....	10	3	1	..	..	..
American Rapid Co.						
Useless wires.....	6	4	..	..	1	..
French Cable Co.						
Useless wires.....	27	4	..	3	..	1
Postal Tel. Co.						
Useless wires.....	8	4	..	..	1	..
Gold and Stock.						
Useless wires.....	1	1	..	1	..	1
Fire Department.						
Useless wires.....	115	75	8	12	..	..
Useless poles.....	38	16	3	6	6	..
Other violations.....	8	8	..	..	1	..
Total.....	161	99	11	18	7	..
Police Department.						
Useless wires.....	32	11	5	5	2	..
Useless poles.....	8	2	..	..	..	..
Total.....	40	13	5	5	2	..
No Owners.						
Useless wires.....	866	..	..	..	324	627
Useless poles.....	440	..	..	..	134	120
Other violations.....	2	..	..	..	1	2
Total.....	1,308	..	..	..	459	749
Grand Total.....	7,146	1,580	375	671	981	1,251

It will be seen that the total number of violations reported upon is 7,046; the total number of notices sent, 3,208; the number of notices attended to 981. It should be explained that many of these notices cover a large number of violations, and the record of the number of violations is much smaller than it would be were each distinct violation recorded. As it is in the report, the particular violations are not recorded where one violation is sufficient to cause danger or warrant removal.

The following table shows the total number of poles and amount of wire removed as a result of the work of the Board, either by the Companies or by the bureau of incumbrances of the Department of Public Works:

1889.	Poles.	Miles of wire.
By the Companies.....	1,370	2,087
By the Department of Public Works.....	2,626	2,582
Total	3,996	4,669
Previously Reported.		
By the Companies.....	395	701
By the Department of Public Works.....	381	245
Grand total.....	4,772	5,615

With reference to the effect of the action of the Department of Public Works upon the service of the electrical companies, I have to report that the following correspondence has passed with regard thereto:

The first letter shows the line of policy adopted before the Department of Public Works was called upon to act by the resolution of the 12th of October, the latter ones the policy adopted after the action of the Department in removing dangerous wires when the injunctions granted by Mr. Justice Andrews were discontinued.

OFFICE OF THE BOARD OF ELECTRICAL CONTROL,

1266 BROADWAY.

The Mayor of the City, President (ex-officio); Theodore Moss,
Secretary; Jacob Hess, Daniel L. Gibbens, Commissioners.

NEW YORK, July 5th, 1889.

TO THE PRESIDENT OF THE

COMPANY.

DEAR SIR:—Certain occurrences of late in the City of New York point distinctly to the fact that the Rules and Regulations of the Board of Electrical Control with regard to overhead electric light circuits are not complied with. There have been instances where accidents have occurred fatal or dangerous to life, which, in view of these rules and regulations referred to, are utterly inexcusable. Overhead circuits have been overloaded to such an extent as to be destroyed, and an improper insulation is continued in running overhead lines, notwithstanding that the Rules and Regulations of the Board of Electrical Control directly and positively forbid it.

I take this occasion privately of calling your attention to these violations of the Rules and Regulations of the Board, in order that the matter may not become the subject of public discussion, and in order that I may not be obliged in my capacity of Electrical Expert of the Board to advise the shutting off of all of your circuits until such time as they are made safe or, in default of this, the absolute prohibition of high-tension currents in the City of New York.

The Board of Electrical Control has so far seen fit to make no radical restriction upon the amount of current which can be carried upon electrical conductors in the City of New York—as has been done in other cities, to the great

detriment of the electrical service—believing that, with proper insulation and attention, a sufficient factor of safety can be attained, whatever the current may be. It is for the electrical companies to see to it that they are not unduly restricted, as the result of negligence and false economy, in the construction and care of their lines. Not only is this to your interest as far as any action on the part of the authorities is concerned, but also that you may relieve yourselves of the odium which attaches to your business in the public mind and prevent the pecuniary and other punishment certain to come upon you whenever you are brought before juries or other judicial tribunals upon whatever charge can possibly be brought against you.

There can be no doubt of the authority of the Board of Electrical Control in the premises to regulate you and your service to any extent that may appear to be necessary for the public safety, as reference to the Act of 1887, Chapter 716, which prohibits the use of any electrical conductors in the City of New York not approved by the Board, will speedily convince any one considering it.

The Rules and Regulations to which I have referred and which are numbered XXII., XXIII., XXIV. and XXV. of the Rules and Regulations of the Board of Electrical Control for Overhead Conductors for Electric Light and Power, are sufficiently simple for easy comprehension, and can readily be complied with. If they were so complied with, nothing but gross carelessness or the intervention of Providence could cause serious injury to life or property through the use of high-tension currents.

I can confidently state that it is the determined intent of the members of the Board of Electrical Control to reduce the danger from electrical service in the City of New York to the minimum, and unless the electrical companies operating high-tension currents manifest great change in disposition with reference to the following out of the Rules and Regulations which have been laid down, harsh measures will be resorted to, so that the public safety may be assured.

Hoping that these suggestions will receive your careful consideration, in your own interest, as well as that of the public, and that you will regard them not only in the light of the present, but also as referring to the future of the business of supplying electric light and power in the City of New York, I remain,

Yours very respectfully,

(Signed)

SCHUYLER S. WHEELER,

Electrical Expert.

OFFICE OF THE BOARD OF ELECTRICAL CONTROL,

1266 BROADWAY.

The Mayor of the City, President (ex-officio); Theodore Moss,
Secretary; Jacob Hess, Daniel L. Gibbens, Commissioners.

NEW YORK, December 30, 1889.

TO THE PRESIDENT OF THE

COMPANY.

SIR:—A letter of which the enclosed is a copy has been sent to the Commissioner of Public Works.

Although all the known dangerous points of the lines of Electric Lighting Companies have been certified to the Commissioner of Public Works, it is not to be assumed that all the remaining electric light wires are safe; but further inspection is required; and it is for this reason that a reduction of the number of gangs at work under the Department of Public Works is asked for.

Should you have any circuits remaining which are complete and which you desire to operate either in connection with the subway or otherwise, and will inform me, I will have such circuits inspected, and any dangerous points which may remain, pointed out to the Commissioner of Public Works before taking up other matters.

Very respectfully,

(Signed)

S. S. WHEELER,

Electrical Expert to the Board.

OFFICE OF THE BOARD OF ELECTRICAL CONTROL,

1266 BROADWAY.

The Mayor of the City, President (ex-officio); Theodore Moss,
Secretary; Jacob Hess, Daniel L. Gibbens, Commissioners.

NEW YORK, December 30, 1889.

HON. THOMAS F. GILROY, Commissioner of Public Works:

DEAR SIR:—The following are the streets wherein dangerous poles and wires of electric lighting companies are known to this Board to exist:

Canal street.

Greene street.

Chambers street.

Fulton street.

Ninth avenue.

West Broadway, from Canal to Franklin.

Duane street, at Nos. 194, 212, 220.

Harrison street, from Greenwich to Washington.

Worth street, from Church to Broadway.

Church street, from Canal to Franklin.

Bowling Green.

Third avenue, east side.

Bowery, east side.

30th street, at Third avenue.

15th street, from Ninth to Tenth avenue.

125th street.

13th street.

Greenwich street, at Fulton, at Marion, at Little 12th, 42, 48, 22, 16 and 8

Washington streets, 39th street, Fulton and Dey streets.

23 Astor place.

218 6th street.

Second avenue, from 2d to 4th street, from 23d to 33d street, and from 56th to 58th street.

Seventh avenue, from Greenwich avenue to 27th street.

56th and 58th streets, from First to Third avenue.

Essex street, from Grand to Canal.

70 Warren street.

Tenth avenue, from 16th to 21st street.

7 Frankfort street.

Cliff street from Fulton to Frankfort.

Gold street, from Fulton to Frankfort.

First avenue.

Avenues A, B, C and D.

South Fifth avenue.

Grand street.

Eighth avenue.

Broadway and 39th street.

At the six last named points your men are now at work, under the advice of our inspectors, and these streets should be finished, and will be shortly. The other points contained in the above list can then be taken up and completed.

After this work is done, all of the known dangerous spots will have been removed, and the remaining work, which will consist of taking down lines "cut dead" at both ends in such a way as to be unserviceable and useless obstructions, as well as the remaining less known and less dangerous spots to be visited hereafter, will require an inspection by this Board before they can be pointed out to you.

The removal of the dangerous poles and wires indicated in the above list will substantially prevent the operation of any dangerous poles and wires in the city; and it is suggested that, after completing said list, not more than two gangs be continued, so that the services of our other inspectors can be had to determine the condition of the remaining poles and wires.

Very respectfully,

(Signed)

S. S. WHEELER,

Expert to the Board.

No replies have been received from the Electrical Companies to this last communication as yet; but the only companies known to be operating overhead wires on streets where dangerous poles and wires have been removed are the Harlem, Manhattan, Mount Morris and United States.

I have to recommend that the Board furnish this department with at least three additional Inspectors of Electrical Conductors; and also have to recommend that the Rules and Regulations of the Board be altered and improved so that they will read as follows:

OFFICE OF THE BOARD OF ELECTRICAL CONTROL,
1266 BROADWAY, N. Y.

RULES AND REGULATIONS FOR OVERHEAD WIRES.

Unanimously adopted, January, 1890, to take effect immediately, superseding all other rules:

Wires are divided into two classes—First Class, those for telegraph, telephone, etc; Second Class, those for electric light and power.

POLES.

1. Two lines of poles bearing conductors of a like class shall not be erected on any street or avenue.
2. Two lines of poles shall not be erected on the same side of any street or avenue.
3. Poles shall be set in the sidewalk six inches from the outside curb, and no pole shall be placed within ten feet of any lamp-post or other pole, except at street corners where necessary in order to support wires running on the cross street.
4. All poles now standing, or erected hereafter, shall be branded or stamped with the initials of the company owning them, at a point not less than five nor more than seven feet from the street surface; and when a pole is occupied by wires belonging to more than one company, each group of cross-arms, or where necessary the support of a single wire of different ownership, must be distinguished by some characteristic paint, mark or fastening.
5. Electric light lamp-posts shall be in accordance with a plan approved by the Board.
6. All poles carrying more than two wires shall be at least forty-five feet high, uniform in size, straight and painted from top to bottom—a very dark color from the sidewalk to a point eight feet high, and a dark green color above that.
7. All poles for carrying not more than two wires shall be 25 feet high, straight, uniform in size, and painted from top to bottom—a very dark color from the sidewalk to a point eight feet high, and a dark green color above that.
8. Cross-arms shall be uniform in length, strengthened by braces, and painted the same color as the poles, the cross-arms of each company being distinguished by some characteristic mark.
9. Each line of poles must be run on one side of the street only, except when absolutely necessary to change to the other side; but this may only be done by the permission of the Board or of its Engineer or Expert.
10. Poles shall be uniformly spaced, and about sixty to the mile. This requires on the short city blocks of two hundred and sixty feet, alternately three and two poles to the block.
11. Conductors must not be placed upon fixtures erected or maintained for supporting wires of the other class.
12. All existing regulations of the local authorities in regard to the placing of poles and stringing of wires are to continue in force, except when in conflict with these rules; and the Rules and Regulations of the New York Board of Fire Underwriters must be strictly observed.
13. When any company is permitted to erect poles, or other fixtures bearing lamps for the purpose of lighting the streets or public places of the city, the permission is subject to the following provisions, which are expressly made a condi-

tion of said permits. Whenever the contract for lighting any such public places shall be given to another company, the company who erected said lamp-posts shall, on tender of the first cost thereof, yield possession of the same to the other company obtaining the new contract, except in cases where the company owning the lamp-posts prefers to remove them.

14. All broken and "dead" wires, and all wires, poles and fixtures not actually in use—subject to rule 28—must be removed. When a pole is taken down it must be removed from the streets the same day. New poles must not be brought upon any street more than two days in advance of their erection. Any pole that shall be on any street more than two days shall be removed by the Department of Public Works, at the expense of the party owning it.

WIRES.

15. All wires shall be fastened upon poles or other fixtures with glass, porcelain or rubber insulators, approved by the Expert, and must be stretched tightly and fastened with a strap of the same kind of wire.

16. No wire shall be stretched within four inches of any pole, building or other object, without being attached to it and insulated therefrom. All wires strung on housetops must be nine (9) feet clear of roof.

17. No wire shall hang within twenty feet of the pavement at the lowest point of sag between supports, except where required to reach a lamp or other connection, and must then be protected by extra covering and be rigidly fixed and out of the way.

18. Every line, pole, fixture, etc., must be kept in thorough order, repair, and conformity with these rules and specifications, upon penalty of forfeiture of all permits granted to the owner by this Board, but no additional poles or wires can be erected under cover of repairs, nor shall any route or location be changed without a permit.

ELECTRIC LIGHT AND POWER WIRES.

19. All electric light conductors shall be secured to insulating fastenings, and covered with an insulation which is water-proof on the outside and not easily worn by abrasion. Whenever the insulation becomes impaired it must be renewed immediately.

20. All joints must be as well insulated as the conductors, and the insulation of joints must be maintained. A rigid insulating sleeve clamped over the joint is preferred.

21. Every wire must be distinguished by a number plainly marked on each cross-arm under the insulator. Day circuits must be conspicuously distinguished. All arc lamps must be so placed as to leave a space underneath of nine (9) feet clear between lamp and sidewalk.

22. Every line entering a building shall be controlled by a cut-off placed near the entrance, in sight, and easily accessible.

23. In the construction of lines the insulation to be used must be approved by the Expert of the Board in writing, and the insulation resistance must be main-

tained in accordance with a standard to be not less than 3 megohm per mile per hundred volts. And under no circumstances shall Underwriters' wire be used.

24. All connections with lines of electric light conductors shall be made at right angles to the same; and connections to buildings shall be run straight across to the building, and then down the front of the building.

25. The insulation must be preserved throughout the entire circuit, and if any portion of a lamp or fixture is a part of the circuit and can be touched, it must be insulated.

26. All conductors shall have a resistance uniformly distributed of not more than 30 ohms per mile per ampere, and proportionately less for heavier currents.

27. All circuits must be tested every hour, and when a ground comes on, effort must be made to remove it at once. Failing in this, the current must be discontinued until the insulation is restored.

28. No unused loops from electric light circuits shall be allowed to remain after lamps are taken away, except in cases where it is positively known that the lamp will be required again within three months, and where there is no underground conduit for that class of circuits. When allowed to remain the joint in the loop must be as well insulated as the line itself.

29. From and after date no company shall do business of electric lighting in the City of New York without a certificate of the Board, granted on the recommendation and after inspection by the Expert of the Board, to the effect that its lines comply with all the Rules and Regulations of the Board, and that its plant is in proper condition for the doing of its business. The force of the certificate to continue until changes are made, of which the Board must be notified and approve, or so long as the plant and conductors remain in the same condition as when inspected.

LINEMEN.

30. All linemen must be furnished with rubber gloves and must wear them and must wear a badge in a conspicuous place, giving his number and the name of the company by whom he is employed.

PERMITS.

31. All companies are authorized and directed to make necessary repairs to their lines of conductors. The general permit under which this may be done does not, however, cover the erection in any street, avenue or highway of any additional poles or other similar fixtures, and has absolutely no reference whatever to lines which have been ordered underground by the Board, and which the Mayor has been requested to remove.

In the case of such lines, where notice has been given that underground accommodations have been provided, and the ninety days of notice required by law have elapsed, and the Mayor has been requested to remove the same, companies owning or operating said lines are not authorized to make any repairs or connections or to go upon the poles bearing such lines for any purpose whatever, except to remove the said lines of electrical conductors in conformity with the directions of the Board.

32. The secretary is authorized to issue to companies operating electrical conductors, all permits required by them for the making of connections necessary to the business of said companies with lines now in use, and which the Mayor has not been requested to remove, upon the certification of the Expert that there is no subway in the street in question, for this class of conductors. Said connections to be in every case in accordance with the Rules and Regulations of the Board.

33. All permits of the Board for overhead wires and fixtures are granted only pending the providing of underground accommodations in the neighborhood of the street or avenue for which the permit is granted.

34. Any member or officer of the Board, and every inspector employed by it, as well as every member of the police force of the city, shall be entitled to examine permits under which work of any kind is being done.

35. No permit shall be granted for the erection of any overhead structure nor for the renewing of any lines already existing in any street in which underground accommodations for the service have been provided, and the ninety days notice required by law has elapsed.

36. The violation of any of the rules and regulations of the Board shall operate ipso facto as a revocation of the permit held by the company or person guilty of such violation.

37. Every company or person erecting poles, wires or fixtures must make and leave, at least once each week, at the office of the Board, such records of the fixtures, etc., which they are erecting, and of all of the same that they have in use, as are required by the Engineer and the Electrical Expert of the Board, and in such form as shall be prescribed by them.

38. The companies or persons owning or controlling poles in any street or avenue shall allow the same to be used by other companies or persons operating conductors for similar electrical service when authorized to do so by the Board, on tender of proper compensation, to be determined by agreement between the parties interested. In default of such an agreement the amount of such compensation shall be determined by the Board. This rule imports a contract on the part of each company or person owning or controlling the poles on any street or avenue, not only with the Board but also with each company or person who shall under its terms be qualified to demand the privileges it confers, to permit this joint use of poles.

And in accepting any permit the applicant thereby binds himself to this agreement.

With reference to the accidents which have occurred in the streets and which have been investigated by me I have to report that, in my judgment, they would all have been prevented by observance of the Rules and Regulations of the Board.

- The deaths which have occurred and the causes are given below.

Meyer Streiffer, a peddler, was killed on East Broadway, April 14th, 1888, by touching a hanging telegraph wire in contact with a United States Company's circuit. This death would not have occurred if all broken and "dead" wires had been removed under the rules of the Board, and in all probability it would not

have occurred had a proper insulation been maintained in conformity with the rules by the United States Illuminating Company.

Fred Witte, clothing salesman, was killed at 200 Bowery, April 28th, 1888, by touching a United States Company's lamp. This death would not have occurred had the lamp been properly insulated and sufficiently high above the pavement.

John E. Feeks, a lineman of the Western Union Telegraph Company, was killed while in the performance of his duties at the corner of Chambers and Centre streets, on October 12th, 1889. This death was due to the neglect of electric lighting companies to carry out the rules and regulations of the Board of Electrical Control with reference to insulation and to the keeping away from the wires of the telegraph and telephone companies.

Henry Harris, a clerk, was killed by the Brush current, November 30th, 1889, while carrying a showcase into a store. This death was due to the fact that the lamp of the Brush Company was not properly insulated and the wires which carried the current to it were not properly insulated, and the lamp was nearer the sidewalk than is proper.

The following are the streets and avenues where wires should be ordered removed after ninety days of notice, owing to the building of subways:

ELECTRIC LIGHT WIRES:

125th street from First to Eighth aves.
Third ave. from 130th street to 6th street.
Bowery from 6th street to Chatham square.
Broadway from 13th street to Beaver street.
Fulton from Broadway to Washington street.
Washington from Cortlandt street to Fulton street.
Houston from First ave. to Hancock street.
23d street from 4th ave. to Eleventh ave.
27th street from Broadway to Madison ave.
30th street from Broadway to Third ave.
29th street from Third ave. to First ave.
42d street from Broadway to First ave.
59th street from First ave. to Eighth ave.
Eighth ave. from 42d street to 59th street.
Seventh ave. from 45th street to 59th street.

Also the Trunk Electric Light Wires in streets adjacent to subways as follows:

13th street from First to Sixth ave.
24th street from First to Third ave.
27th street from First to Third ave.
29th street from First to Third ave.
30th street from Third ave. to Broadway.
2d ave. from 104th to 125th street.
4th ave. from 14th to 32d street.
43d street from 6th to Vanderbilt ave.
55th street from Eighth to Third ave.
Chrystie street from Houston to Division street.

Telephone and Telegraph Wires in the following streets and avenues:

Bond street from Exchange pl. to Wall street.

Nassau street from Wall to Pine street.

Wall street from Nassau to Pearl street.

Cedar street from Church street to North River.

John street from Nassau street to New Bowery.

Dey street from Broadway to Greenwich street.

Barclay street from College pl. to West street.

Murray street from College pl. to Broadway.

Houston street from Chrystie street to First ave.

Centre street from Reade to Grand street.

38th street from Lexington ave. to First ave.

45th street from Sixth ave. to Broadway.

58th street, from 8th avenue to 10th.

Tenth avenue, from 58th to 59th.

Lexington avenue, from 65th to 79th.

79th street, from First avenue to Fourth.

Also the trunk telegraph and telephone wires in the following streets, adjacent to subways:

(W. U.) 57th street, from 10th to 3d avenue.

(M. T. & W. U.) Seventh avenue, from 59th to 11th.

(W. U. & M. T.) Fourth avenue, from 79th street to Clinton place.

(W. U.) 46th street, from Eighth to First avenue.

(W. U.) 41st street, from Broadway to Sixth avenue.

(M. T.) 39th street, from Eighth to Lexington avenue.

(M. T.) 19th street, from Seventh to First avenue.

(W. U.) Amity street, from Sixth to South Fifth avenue.

(W. U. & M. T.) Bleecker street, from Downing to Greene.

(M. T.) Prince street, from Macdougall street to Bowery.

(M. T.) Hester street, from Centre to Chrystie.

(M. T.) 1st street, from Fourth to First avenue.

(M. T. & W. U.) Mercer, from Clinton place to Canal.

(M. T.) Wooster, from West Fourth to Canal.

(W. U.) Church street, from Canal to Barclay.

(M. T. & W. U.) Elm street, from Reade to Grand.

(M. T. & W. U.) Baxter street, from Worth to Grand.

(M. T.) Warren street, from West to College place.

(M. T.) Cliff street, from Frankfort to John.

(M. T. & W. U.) Fulton street, from Greenwich to Front.

(W. U.) Liberty street, from West to Gold.

(M. T.) Crosby street, from Bleecker to Howard.

(M. T. & W. U.) Water street, from Old Slip to Dover.

The following are the streets and avenues where wires have already been ordered underground for more than ninety days, and where they should be ordered removed by the Mayor immediately:

TELEPHONE AND TELEGRAPH WIRES.

(W. U. & M. T.) Centre street, from Worth to Grand.

(W. U.) Dey street, from Church to Greenwich.

- (W. U.) Nassau street, from Wall to Pine.
 (Mutual) Tenth avenue, from 58th to 59th.
 (W. U.) Houston street, from Chrystie to Allen.

ELECTRIC LIGHT WIRES.

- 42d street, from Broadway to Fifth avenue.
 14th street, from First to Third avenue.
 27th street, from Madison to Sixth avenue.

DEAD POLES AND WIRES.

The following are points at which there are dead poles and wires which should be removed immediately:

- South street, from Roosevelt street to James Slip, 4 poles and wires. (M. T. & T. Co.)
 James Slip, north side, 3 poles and wires. (M. T. & T. Co.)
 S. E. cor. Park Row and Chambers street, pole. (Owner unknown.)
 N. E. cor. of Cedar and Greenwich streets, pole. (Owner unknown.)
 48 West street, pole. (Owner unknown.)
 West street, from Rector street to Cedar street, Underwriters' wire on U. S. poles.
 N. W. cor. of Cedar and West streets, pole. (Owner unknown.)
 87 Barclay street, loop of Underwriters' wire from roof of building.
 S. E. cor. of Barclay and College place, pole. (Owner unknown.)
 S. E. cor. of Barclay and Church streets, pole. (Owner unknown.)
 Cor. of Temple and Thames street, pole. (Owner unknown.)
 Cedar street, bet. New Church street and Broadway, three useless poles carrying Daft power wire. (W. U. Tel. Co.)
 W. side William street, from John street to Wall street, line of dead poles carrying power wires. (W. U. T. Co.)
 562 10th avenue, dead pole. (Owner unknown.)
 156th street, St. Nicholas avenue, west side, to 170th street, King's Bridge road, then up 10th avenue, dead and dangerous. (M. T. & T. Co.)
 8th street, from East River to Avenue B, dead poles. (Brush.)
 41st street, Broadway to 6th avenue, pole line. (U. S.)
 44th street, 3d avenue to Depew avenue, poles. (U. S.)
 College place, bet. Chambers and Warren streets, 2 poles. (Owner unknown.)
 880 8th avenue, 1 pole. (U. S.)
 New Church street, east side, bet. Morris and Exchange alley, 2 poles. (Owner unknown.)
 14th street, 6th to 7th avenue, line. (W. U. Tel. Co.)

All lines already ordered down by his Honor the Mayor, have been removed either by the companies or the Department of Public Works, except where city department wires have interfered.

Respectfully submitted.

SCHUYLER S. WHEELER,

Electrical Expert.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday, January 31st, 1890, at 1 o'clock P. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

Mayor Grant directed that Commissioner Gibbens' name, which had been omitted from the roll-call, be called. This being done, there was no response, he being absent.

The minutes of the last meeting were read and approved.

Commissioner Hess suggested as the next thing in order the taking up of the consideration of the report of the Engineer laid over at the last meeting.

Mayor Grant stated, in reference to this report, that he had only glanced at it, but had shown it to the Commissioner of Public Works; and he thereupon asked the Commissioner, who was present, if the recommendations of the report were in contravention of his plan for the repavement of the streets.

Commissioner Gilroy: There is nothing in contravention of the plan in regard to paving of the streets, providing the work is done early; unless it is commenced early it will interfere with my paving programme.

The Board then took up and considered in detail that portion of the report recommending the construction of subways for telephone and telegraph service in certain named streets, and questioned Engineer Kearny as to the necessity and propriety of each of the particular subways recommended.

Commissioner Gilroy: I give you notice here and now that I will not give a permit for the opening of a street that is newly paved unless I am ordered by the Court.

Mayor Grant suggested the advisability of laying the conduits in those of the streets about to be repaved, at the time of their repavement, to save the streets being twice torn up, and in the interest of economy; and

Commissioner Gilroy stated its impracticability, inasmuch as the subway construction would proceed so much faster than the repaving; to whose views the Engineers of the Board and the Construction Company assented, whilst raising yet some other objections to it.

Mayor Grant stated that, while he was not convinced, he would defer to their opinion.

Mayor Grant: How long will it take to construct these subways for the telephone and telegraph service?

Commissioner Hess: It will need a little addition and multiplication.

President Lauterbach and Engineer Beckwith, of the Construction Company, retire for a moment for consultation.

President Lauterbach (returning:): That can all be completed during the next season.

Mayor Grant (to Vice-President Cutler, of Metropolitan Tel. and Tel. Co.): Are there any more conduits for the telephone and telegraph service that will require to be laid during the coming season?

Mr. Cutler: I do not think there is.

Mayor Grant: You had better know—for I will not sit here and order another subway after the Commissioner of Public Works has ordered his pavement.

Mr. Cutler: I am satisfied now from the present standpoint; I do not know what requirements might arise from some unforeseen occurrences.

Mayor Grant, after some further discussion, offered the following resolution:

Resolved, That that portion of the report of Engineer Kearny, dated January 3d, 1890, recommending the construction of subways for telephone and telegraph service in the following streets and avenues:

Greene street, from Spring to Canal street,
18th street, from Seventh to Eighth avenue,
Eighth avenue, from 18th to 38th street,
23d street, from Second avenue to Madison avenue,
58th street, from Tenth avenue to North River,
79th street, from First avenue to Avenue A,
124th street, from Lexington to St. Nicholas avenue,
Lexington avenue, from 58th to 21st street,
21st street, from Lexington to Fourth avenue,
Fourth avenue, from 21st street to 14th street,
Lexington avenue, from 79th to 129th street,
129th street, from Lexington avenue to Third avenue,
Third avenue, from 129th street to Harlem River;

construction to be of iron pipe laid in hydraulic cement concrete, the number of ducts to be ten, subject to increase in the discretion of the Engineer, be approved; and that the Consolidated Telegraph and Electrical Subway Company be authorized and directed to construct these subways during the present season, and as rapidly as possible, first commencing and completing their construction in those streets and avenues which are to be repaved, and in advance of and in time for their repavement during the present year.

Unanimously adopted.

Commissioner Gilroy stated to the Board that he would give every facility for the laying of the trenches for the building of these subways.

The Board now took up and considered seriatim the routes recommended by Engineer Kearny for subways for electric lighting, and, after questioning him in regard to them, and some considerable discussion, disapproved of those, as follows:

Fifth avenue, from 8th to 59th street.

Chambers street, from West street to New Bowery.

Franklin street, from Greenwich street to Broadway.

Mayor Grant: Of course I know nothing about it of my own knowledge, but the newspapers have been full of a statement that certain corporations are combining and certain interests are consolidating—for my own part, I want to know what it is.

Mr. Lauterbach: I will give you such information as I have on the subject. Last fall a suggestion was made—at the time of the Feeks' disaster and two or three other horrible calamities that happened about the same time—that it was essential the work of building the subways should be expedited as rapidly as possible. The work that was then contemplated was of such an extent that it appeared to me that it would be possible by the exercise of every energy for the Subway Company to complete it. There was a great deal of work ordered—the whole of Third avenue, and as much more work as Third avenue comprises. The Company was able by dint of energetic efforts as I have ever known to be used, in weather that I think was more opposed to the prosecution of work in the proper way than has been known in the experience of any one engaged in similar work, to accomplish the whole of the work within the time limited. Another season was about to come upon us. There came before the Board various applications; some on the part of individual companies to be permitted to build their own electric light subways; on the part, I believe, of an organized company that claimed to have the facilities for doing much more rapid work than the Subway Company have been able to perform. That matter remained in that condition. The report of the Engineer at the last meeting of the Board and the applications that came in from the various electric lighting companies made it manifest that an immense deal, an unusual quantity of work would be exacted from the Subway Company during the coming season. I believe that the volume of electric light work alone will reach thirty miles of trench, and with an average of ten ducts in each trench. The other work, the telephone, telegraph and Edison work is additional to that, and separate from it. The Edison service is usually performed in the same trench as the telephone and telegraph service, and where it is not in the same trench is apart in all cases from ordinary electric light service; so that the business divides itself into two trenches, one substantially for the telephone, tele-

graph and Edison service, the other for the other electric light service employed by all the other companies. It was clear and is clear that the utmost expedition in the performance of this work should be made. If the question is put to me by your Honor whether we can do the whole of this work within a reasonable period, I say, Yes; we will do it as expeditiously and as thoroughly as we can, and in entire conformity with our contract. I have had personal interviews with representatives of the various electric light companies and a number of interviews with Mr. Peckham, or his representatives, who represented a company that came in and stated that it was equipped to perform this work in a remarkably short space of time. And there have been informal discussions leading up to this suggestion, that if it be deemed wise by the Board of Electrical Control that this work should be divided, that the work may be divided. Of course, there are important interests to protect. It is important that some regard for fair play that has always prevailed while this Subway Company has performed the work, and concerning which there has never been any dispute of perfect fair play to every company interested in this matter, should always prevail. If there should be any change, the change should be such that no company should have any advantage over the other. I think heretofore, so far as that part of the suggestion is concerned, this Company has been beyond criticism; no one has been able to show any discrimination in favor of one as against the other; and the law has been complied with both in letter and in spirit. The next important interest would be the protection of the citizens, which, of course, are in the hands of the Mayor, and would be provided for. The discussion originated by my suggesting that, perhaps, this Company would take a sub-contract—just as we had sub-contracts with other companies from the beginning to the end. They did not desire to make a sub-contract, but desired to take a share of the contract. As I viewed the suggestion, we have no right to assign the contract except by direction of the Board of Electrical Control, and with your ascent, and only in such a way that shall absolutely preserve the city's interest. And the matter to-day stands in this situation: that you have directed us to build ten miles of telegraph and telephone subway, that you will probably direct us to build two or three miles of Edison subway, that we can perform that service during the coming season; that, in addition to that, there is put upon us the task of building thirty miles of electric light subways, if that task is put upon us it is our legal duty to assume it and to perform it, and it will be assumed and will be performed. If you ask us within what period thirty miles of electric light subway and ten miles of telephone and telegraph subway and three miles of Edison subway can be built, I will say that two years would be the minimum. But it may be possible—it is almost probable—that if we restricted ourselves to the one system of work, and it were entirely satisfactory to the city and to the electric light companies, that if they had the assurance the same justice would be meted out in all cases as it had endeavored to be done heretofore, that it would perhaps secure, probably secure greater expedition of work, which is

what the people seem to be desirous of having. That co-ordinately with the telephone and telegraph and Edison work, the Company which has expressed itself to be so well equipped, and is the only Company that has maintained its desire to enter into this field of service, if all those conditions precedent are accomplished, and it were thought the wise thing by the Board and by the Municipality that such a division in the interest of the public would be a desirable thing to accomplish, I think our discussion has gone to the extent of our being able to state that, under those circumstances, and with those conditions, and if the work was done entirely to the satisfaction of the authorities—in this case the Board—there would be a disposition for an arrangement and adjustment of the character indicated. As to the consolidation of the companies, behind that and above that, I have no knowledge, that I know of no such consolidation, except that the Safety Company has the right to the possession of a majority of the stock or in some other way the control over the United States and Brush Companies. So far as the Manhattan, the East River, the Ball and all other companies that have existence—those that are active and those that are inactive—are concerned, I know of nothing, either directly or indirectly, that justifies the assertion that any such consolidation has been effected. I am correct in that, am I not, Judge Kelly?

Judge Kelly: So far as the East River is concerned.

Mr. Lauterbach: Mr. Leslie?

Mr. Leslie: So far as the Manhattan is concerned—that any such thing is accomplished, or any such thing suggested.

Mr. Lauterbach: I think this is a frank—not a full, but a frank statement of the situation, but is as full as the subject requires.

Mr. Peckham: If in the present status you have laid out a programme here, which my friend Mr. Lauterbach says, under the existing circumstances, would require a minimum of two years to carry out, now, the Company I represent will carry out the portion of it for electric lighting purposes in one year. I understand Mr. Lauterbach to say that he will carry out the balance for telephone and telegraph service in the year. The result of it is that by the two companies and the two contracts the public is better served by the work being done in one year, while the one Company would take two years.

Mayor Grant: Do you propose in this to have a sub-contract from the Construction Company, or do you propose a contract from this Board?

Mr. Peckham: I propose to accept a suggestion I heard your Honor make, and make a contract with this Board; that we will go on and build these subways according to the plan proposed there for electric lighting purposes; we will do it in a year.

Mayor Grant: Does this give a monopoly of the electric lighting business to any one individual company through something that does not appear on the surface?

Mr. Peckham: If there is anything I have been unable to perceive it; I cannot see how there is any possible monopoly of the electric lighting business; there is some monopoly of the subway business; that is necessarily implied in the law itself.

Judge Kelly: As counsel to the East River Company, I say this is a matter, of course, in which we are very much interested. If its proceeding should bring about a monopoly of the electric lighting business by a control of the building of the conduits in the hands of one party——

Mayor Grant: You heard, Judge Kelly, what I said about this thing, that there were to be sufficient conduits built by any company for the accommodation of any other company that might see fit to operate its lines in that territory; and, while I am frank to say I cannot see any monopoly in it, I asked Mr. Peckham that, knowing his standing here, and that if he knew it he would certainly state it.

Judge Kelly: It is a matter of current rumor that what the Standard Company proposes is in the interest of what is known as the Westinghouse interest in New York. That is the danger to the public and the danger to the other companies. Whatever is to be done should be done carefully, in order that all interests should be guarded and protected. I believe at an earlier meeting a gentleman representing that interest stated the ducts could be made and rented for \$500 per mile; the present rental is \$1,000 for 3-inch ducts; and I am free to say, Mr. Mayor, at the first blush, that your own suggestion that the companies should build contiguous to their own stations or factories, providing at the same time a sufficient number of ducts for other companies to use—at first blush that strikes me as very fair; and I am inclined to think the East River Company would prefer something of that nature to leaving it to the Engineer of the Board to make these different portions of work a harmonious whole.

Mr. Leslie (of the Manhattan Company): I desire to state that no notice of this meeting was received by us, and not until this morning was it definitely known there would be a meeting. We understood this topic might come up for discussion, and had prepared ourselves for representation by counsel; not having received any notice of this meeting in time, we were not able to get track of our counsel.

Mr. Peckham: Is your counsel Mr. Root?

Mr. Leslie: Yes, sir.

Commissioner Hess offered the following resolution:

Resolved, That the question of making a contract for the construction of electric light subways with others than the Consolidated Telegraph and Electrical Subway Company be referred to the Corporation Counsel, with a request that he report back to this Board at its next meeting.

Unanimously adopted.

Mayor Grant: I will call a meeting of the Board just as soon as the Corporation Counsel is ready to report.

Mr. Leslie requested that due notice be given him of the next meeting; and

Mayor Grant directed the Secretary to notify all the electrical companies of the next meeting of the Board.

Expert Wheeler recommended that Section 4A of the Rules and Regulations Governing the Occupancy of the Subways be amended by the substitution of the words "Not more than three" in the place of the words "No two or more" at the beginning of said section.

Mr. Moore (of the East River Company) requested delay in the adoption of the amendment that he might have time to consider the proposed change; and

Mayor Grant offered the following resolution:

Resolved, That Section 4A of the Rules and Regulations Governing the Occupancy of the Subways be amended by the substitution of the words "Not more than three" in place of the words "No two or more" at the beginning of the section, unless objection to it of a serious nature is received within twenty-four hours.

Unanimously adopted.

An application of the Department of Public Works to erect poles and string wires along the old Aqueduct from New York City limits to High Bridge, on the line of said Aqueduct, was granted.

Mayor Grant offered the following resolution:

Resolved, That the applications of the Metropolitan Telephone Company before the Board, to string wires for individual telephonic connections, reported favorably on by the Expert as being in localities where there are no subways, be granted.

Unanimously adopted.

Mayor Grant also offered the following resolution:

Resolved, That the applications of the Edison Electric Illuminating Company for lamp connections which are not already placed, and which may be certified by the Expert as complying with the rules and regulations, be granted.

Unanimously adopted.

Adjourned without day.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Monday, February 17th, 1890, at 2 o'clock, P. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and, on motion of Mayor Grant, approved.

Mayor Grant: The Corporation Counsel's opinion is here, and I will ask the Secretary to read it.

The following opinion from the Corporation Counsel was thereupon read:

New York, February 17th, 1890.

To the Board of Electrical Control:

GENTLEMEN:—I beg to acknowledge the receipt of your communication containing the following resolution:

"Resolved, That the question of making a contract for the construction of Electric Light Subways with others than the Consolidated Telegraph and Electrical Subway Company be referred to the Corporation Counsel, with a request that he report back to this Board at its next meeting," passed by your Board at the meeting held on January 31, 1890, and transmitted to me on the same day.

When I received your communication I made an appointment with the counsel representing, I believe, all the electric light companies doing business in the city of New York, for a public hearing upon all matters affected by your resolution, which meeting was held at the office on the 3d instant. A stenographic report of the proceedings there had is herewith transmitted to you.

It was agreed subsequent to the general discussion which then took place, that the different counsel representing the different electric light companies should file briefs expressing their views upon the subject, and briefs have been received from all of the companies represented excepting the East River Electric Light Company. Since the receipt of these briefs and the discussion had before me, I have given the subject very careful consideration.

A matter similar in some respects was referred to me by his Honor, Mayor Grant, early in October last, and on the 14th of that month I transmitted to him a letter in which I expressed the opinion that, "under Section 6 of Chapter 716 of the Laws of 1887, if the present contract is inoperative or ineffectual for the accomplishment of its just purpose and the purposes of the act, a new contract may be made."

It was claimed at that time that the contract entered into between your Board and the Consolidated Telegraph and Subway Company granted to, and conferred upon, the said Company an exclusive right to construct all the subways to be at any time constructed within the city of New York. This letter was written upon

the assumption that the Consolidated Telegraph and Electrical Subway Company had defaulted.

I am advised, from the discussion which took place in this office between the representatives of the Electric Light Companies and the representatives of the two subway companies that your Board had communicated to the company having the existing contract its intention of requiring said company to build, during the coming year, about forty miles of electric light and power subways and about fourteen miles of telegraph and telephone subways, and that the construction company had expressed the opinion that it would be impossible for it to construct, within the coming year, the fifty-four miles of subway ordered, and indicated a desire to consent that the construction of subways for electric light and power conductors should be entrusted to other companies.

My best judgment is that your Board may make other and further contracts whenever you determine that the existing contract has become ineffectual to carry out the purpose of Chapter 716 of the Laws of 1887; but inasmuch as the construction company has expressed its reluctance to undertake the completion of so large a quantity of subways within the limited time, and has offered its consent that the construction of the subways for electric light and power conductors shall be committed to another company and the construction of the subways for the use of telegraph and telephone conductors only be required from it, I am relieved from the necessity of considering the validity of its claim to an exclusive right, and under the circumstances it is only necessary for me to advise you that you possess ample power to make the proposed contract with the Standard Electrical Subway Company.

On the 5th instant, I received a communication from Mr. Wheeler H. Peckham, counsel for the Standard Electrical Subway Company, enclosing copy of contract, which I have revised and send herewith. His letter advises me that a copy of this contract was sent to Mr. Root, representing the Manhattan Company; Mr. Nicol, representing the East River Electric Light Company. I have received no communication from either of these gentlemen as to any amendments they desire inserted in the contract.

I am,

Yours very respectfully,

WM. H. CLARK,

Counsel to the Corporation.

Corporation Counsel Clark: I would like to supplement that by saying Mr. Nicol called on me this morning at 11 o'clock, after the letter was written, and suggested other matters he would like to have inserted in the contract, and I told him that I would not insert them under any circumstances unless they were ordered by the Board of Electrical Control. I desire to say that in fairness to Mr. Nicol.

The Board hereupon heard statements and arguments in connection with the opinion of the Corporation Counsel and the making by the Board of the proposed contract with the Standard Electrical Subway Company, from counsel representing the several Electric Light Companies, as follows:

Senator Grady: Mr. Mayor and Gentlemen of the Commission, I appeared before the Corporation Counsel as the representative of the East River Electric Light Company at the hearing referred to in the communication just read, and understood that the Corporation Counsel interpreted the resolution of the Board which had been transmitted to him as confining him to the simple question as to the power of this Board to make further contracts, as not opening up the question at all, if the Board had the power, what sort of contract would require to be made, in order to protect the different companies. No brief was submitted on behalf of the East River Electric Light Company, for the reason that it being an abstract question of law, it was thought advisable to let the Corporation Counsel decide it without any suggestion from us or without any brief on our part. We desire to say, however, that we maintain, so far as the East River Electric Light Company is concerned, that this Board has no power to make any further contracts, unless first the Consolidated Telegraph and Electrical Subway Company is put in the position of having done some act or omitted to do some act as constitutes a breach of its contract with the city. That is not the important question to which I now desire the attention of the Board. Just at present I wish to say that there has been no opportunity afforded us of examining into any contemplated contract between the Consolidated Company and the Standard Company, and that we did not understand that any such question was before the Corporation Counsel, and that our understanding was that he distinctly refused to permit a discussion of the terms of any contract, under the resolution which had been sent him. The contract submitted to us by Mr. Peckham and the contract that is referred to by the Corporation Counsel in his letter is a contract between the Consolidated Company, on the one hand, and the Standard Company, on the other hand, which, so far as we have information, is to be subjected to the approval of this Board of Electrical Control, thereby, as we understand it, exempting the Consolidated Company and relieving it from its present position, so far as electric light and power wires are concerned, and transferring that to the new company.

Mr. Peckham: Senator, may I call your attention to the fact that it was a contract between the Board of Electrical Control and the Standard Company.

Commissioner Hess: The contract is not before us at present.

Senator Grady: I understand the Corporation Counsel's communication covering a contract is before you, and I desire to have the Board understand just our relations to that contract. A scheme is on foot—I do not use the word in any offensive sense—a scheme is on foot under which it is intended to divide the underground wires into two classes—one for telegraph and telephone wires, the other for electric light and power wires. It is intended by the Consolidated Company to transfer every such conduit as it has laid for electric light and power wires to the Standard Company. It is intended as a part of that transfer of the scheme—to get from this Board a new contract—a contract with the Standard Company—to continue the building of the conduits for electric light and power wires. Now,

as I said before, we are here to claim that there is no such power in the Board, except in the case of some act or omission on the part of the Consolidated Telegraph and Electrical Subway Company as effects a breach of the contract.

Mayor Grant: You say there is no power—that was a thing we referred to the Corporation Counsel. As far as I am concerned, as for the power, I must be bound by the opinion of the Corporation Counsel on the legal question.

Senator Grady: And you will be very wise in taking his opinion in preference to mine; but as a corollary to that proposition we desire to say that had the Corporation Counsel's opinion stopped there we should not have had a word to say; but you shall see the Corporation Counsel has gone further, he has under cover of the letter which reports his opinion enclosed a contract submitted to him after a hearing was had, a contract which he has amended, and which he proposes shall come to the Board as though an opportunity had been given to us to discuss the terms of that contract with him. Now, all the opportunity that has been given to us, representing as I do the East River Electric Light Company, is to look over a paper sent by Mr. Peckham, with whom, of course, we can have no relations, he being the able representative of a rival corporation. Now, what we desire is that, if any action is to be taken upon any contract before this Board, this Board shall submit to us—a Board with whom we do hold official relations, and into whose proceedings the spirit of rivalry does not enter—such a contract, as offered, for our approval, and we shall submit to this Board such amendments as we deem are required for the protection of the rights of our corporation.

Elihu Root: I have been instructed by the Manhattan Electric Light Company and the Harlem Lighting Company to appear here in opposition to the making of a contract by the Board of Electrical Control with the Standard Electrical Subway Company, which I understand is now applying for a contract with the city. I submitted some time ago to the Counsel to the Corporation some reasons which occurred to me why I thought that you had no power to make such a contract. I assume, however, that you will be governed by the opinion of the Corporation Counsel, which differed from mine, as you properly should be, and I therefore will not argue that subject. I wish to submit to you reasons why—what I consider good reasons—why although you deem you have the power you should not make such a contract. In the first place, the fundamental rule which governs your action, and the rule which furnishes the key of this whole series of legislation upon the subject of the placing underground of electrical conductors, is stated in the 4th section of the original subway act of 1884. "No city in this State," the Legislature declares, "No city in this State shall grant any exclusive privilege or franchise under this act to any corporation or individual by which a monopoly may be created or competition prevented on equal terms." The provisions of law which require us to place our electrical conductors underground are an extreme, although I believe a salutary and wise exercise of the police power;

and if the Legislature had not expressly declared this rule for your action the principles of ordinary justice in the administration of the law would impose that rule upon you. We are forced to place our conductors underground, and you are forced, not only by the express provision of the statute, but by the responsibility that rests upon you as public officers, to see to it that you do not enforce that provision in such a way as to give any one unfair advantage over us in the competition for the public patronage in the use of our light and our power. Now, I submit that the proposed contract in its general scope and effect will, if made with the company which now asks for it, absolutely destroy the equality of conditions to which we are entitled when we obey the act of the Legislature and your injunctions in placing our wires underground. It will do so, in the first place, because the Standard Electrical Subway Company is a Company which, as I am advised, and as my clients direct me to say they are prepared to prove, is but another name for the strongest, the most powerful rival corporation with which we have to compete, that it is owned absolutely by that other corporation, and that if you make a contract with this Standard Electrical Subway Company, under which they can construct and own the subways, into which you compel us to put our wires, you are making a contract with our most dangerous competitor and placing us completely at its mercy. Now, I have before me a paper which contains a statement over the signature of the president of a corporation—containing statements which sustain the assertion which I have just made. It is a copy of a letter from the president, the original of which can be produced if it is called for, although it is not at this moment in my possession—a letter from the president of the United Electric Light and Power Company, that is, the Company which is the owner of the Westinghouse, the United States and the Brush rights. (Mr. Root hereupon read the letter referred to by him.) Now, what is the situation proposed there? It is that this United Electric Light and Power Company, having obtained control of the Westinghouse, of the United States and of the Brush lighting in this city, having secured the right to obtain control of the existing subways for the use of electric light and power conduits, swelling up its capital stock to an enormous amount, upon which it doubtless expects to earn dividends, issuing a million dollars of stock, and owning this Standard Electrical Subway Company which is now before you, proposing to take the entire capital stock of that Company, so that it will not be in fact a corporation such as the laws of this State contemplate, but will be owned absolutely and entirely by the United Electric Light and Power Company, proposing to pay for that capital stock five hundred thousand dollars for the preferred and to put into its treasury for nothing, or under the color of issuing for rights, etc., the whole million dollars of common stock, come to you, through the Standard Company, and ask that you shall give them a contract under which they will build the remaining subways for electric light and power conduits. Well, what will the effect of that be? In the first place, the effect of it will be to create a gigantic monopoly in these subways which are to be administered by you for the equal use of all the people furnishing light and power, and for the equal benefit of the whole city and all the people of the city—to create a gigantic monopoly to owners to use and control these subways

in their own interest. What will the specific effect be? In the first place, it will be this: that if the rental charged for the use of subways by this sham Standard Company, this shadow and image of a company that is set up here to stand between our rival and us, chooses to impose an excessive rental—and we cannot prevent it from being excessive except by going through all the long and difficult and, perhaps, impossible pathway of obtaining an accounting as to the cost of these subways, proving to you just how much they cost and how much is necessary to pay ten per cent. on the cost—

Mayor Grant: Do you claim, Mr. Root, that it is necessary in order to reduce the rates of the Subway Company that we shall have an accounting?

Mr. Root: I say there is no—

Mayor Grant: Cannot we fix or reduce the rates of the Company without any accounting?

Mr. Root: Quite likely.

Mayor Grant: If any company objected to the rates as charged by the Subway Company and made a formal objection to this Board, this Board, at least as far as I am concerned, would endeavor to take the matter up.

Mr. Root: My proposition is, if the so-called corporation which masquerades under the name of the Standard Company charges an excessive rental for the use of these subways, the only course which we have to follow is to come to this Board and convince you that it is excessive. Well, how shall we convince you that it is excessive? Why, only by getting an accounting to see that it is more than ten per cent. I do not know any other way in which we could procure the facts to present to you to show that it was excessive. Now, what would be the effect if the rentals are too high? We think the rentals are too high, and we agree with the gentleman who appeared here in behalf of this same undertaking some time ago, last fall, that the rentals charged by the Subway Company are excessive; but it has been hitherto that it was a tax upon the people of New York, and not a discrimination between different electric lighting companies, because the same rentals were charged to the Westinghouse, to the United States, to the Brush, to the Manhattan and to all the electric lighting companies. They all stood upon an equal footing. It did not give one any advantage over others. But you let one own the subways and the excessive rental is a discrimination in its favor. If the Westinghouse Company charges an excessive rental to itself under one name and receives it under the other, it does it no injury. If the Westinghouse Company charges us an excessive rental, and we lose it, and our rival gets it, it does us an injury.

Commissioner Hess: But you forget the power of our Board to regulate these things.

Mr. Root: I do not forget that, and I do not forget that you put the burden on us of proving to you the rental is excessive, and I say you ought not to give a con-

tract to our rival which will put us in the position where they can charge excessive rentals unless we prove to you they are excessive.

Commissioner Hess: It is a question of examination only. It could be ascertained without putting the burden of proof on the companies.

Mr. Root: You should now fix the maximum rental, so that you will not put us in a position where we are required to put our wires in their conduits, and leave it for some indefinite and unascertained time in the future when we may obtain relief from the excessive rentals. We say if the Subway Company were owned by our rival it would be a discrimination against us of fifty per cent.; and before you put this in the power of one of our rivals, you should cut down the rentals at least fifty per cent. in fixing a maximum rental, and not put us in a position where an immediate injustice follows, not put us in a position where an immediate discrimination follows, leaving us in the future to come to you and get the injustice remedied. There is one other way in which this discriminating effect is produced. You have a code of rules, and, if you make this contract now, those rules will come into immediate effect; and they provide for extensive control by the Subway Company over the conduits, and over the business, practically, of all the companies using the conduits.

Mr. Root read numerous sections of the Rules Governing the Use of the Subways in support of his statement, commenting on them as he read them, and engaging in a discussion concerning the rules, with members of the Board, and with Mr. Lauterbach, of the Consolidated Company.

Mr. Root (continuing): Now, one further consideration, and that is this: If, as I understand, the Corporation Counsel has advised you you have the power to make a new contract—that power irrespective of the consent of the Subway Company—why should the opportunity for the making of that contract be confined to this corporation, and not be thrown open to the public and to electric lighting companies generally? Why should the United Electric Light and Power Company, which is the Westinghouse, United States and the Brush, have the opportunity solely to make such a contract because it has the consent of the Subway Company? If you will frame a fair contract, and put up to public competition the right to make it, follow the policy adopted by the law in respect to railroads and other franchises, put up a fair contract and give the other electric lighting companies of the city and the public an opportunity to bid for the right, I am authorized to say you will have one bidder at the sale, and a responsible bidder, one to carry out any contract that is made, other than the United Electric Light and Power Company; and I see no reason why this Company which considers that it can't water its stock to the extent of millions of dollars provided it gets this right from you, should be placed in a position where it crowds out all competition by virtue of getting the consent of the existing Subway Company, which is based upon the inability of that Company to carry out the contract it has made, and why the other companies should not have an equal chance for a similar contract, and why the people of the city should not have the possibility of obtaining some competition for this valuable right.

Mayor Grant put, and Mr. Root answered, many questions touching the latter's statement and the matter under consideration.

De Lancey Nicol (representing Thomson-Houston people): As I understand the present position, Mr. Commissioners, of this discussion, it is that the Corporation Counsel has passed upon the power of the Board to make a contract with another corporation than the Consolidated Company, in case it shall be deemed expedient for the public interest to do so. Of course, by that opinion of the Corporation Counsel this Board is bound, it having been referred to him. So that the next question which arises before the Board is whether or not it is expedient and for the public interest to make a contract with the Company represented by Mr. Peckham. Now, on that point all that Mr. Root has said with regard to the fact that the Company Mr. Peckham represents is a rival corporation to the interests which Mr. Root represents, and to the interests which Senator Grady and myself represent, is true, and yet, at the same time, it is to the interest of all parties to have the subways built as fast as they can be built, to the interest of the city, and to the interest of the Companies. So that the position we desire to take before the Board is this: While we admit the fact that this is a proposition from a rival concern to build subways, and really to establish a monopoly in the ownership of these subways in the city of New York, yet if it can be done under such circumstances as to protect the other companies, and not to sweep them out of existence, we are willing it shall be done; that is, we are willing that the subways shall be built as expeditiously as possible, provided they are built under such rules and restrictions that all these various interests are not wiped out of existence. Now, if human nature is to-day what it has been in the past, and if men are what they always have been, why, of course, the object of Mr. Peckham's Company is to get a monopoly in New York City, to establish a monopoly of the ownership of these subways. That is the object. It is not a philanthropic purpose they are here for; they are not here to help you, Mr. Mayor, to lay subways before you repave the streets of New York—they are here to make money out of these subways. We are willing that they shall make the money, providing they do not wipe us out of existence, and we want a living chance.

Commissioner Hess: What company do you represent?

Mr. Nicol: The North New York and Thomson-Houston Companies. Now, the rules which are at present in existence were rules as applicable to a neutral Company, that is, Mr. Lauterbach's Company. His Company was neutral between these various interests. These rules, applicable to his Company, and safe as his Company constructed and operated, would not be safe rules provided a rival company built the subways and owned them. This is the first point. The first point, therefore, is that the rules must be revised. The second is that the routes of construction must be agreed upon in order to be agreed upon in the contract. You perceive if you give to a rival company the power to build subways over certain routes they can build subways in the interest of their own concern, and not in the interest of ours. As I understand it, this is a proposition to help out the Consolidated Company and the authori-

ties of the city of New York by constructing subways over certain routes. Now, if you are going to give them contracts over certain routes, we want those routes put in the contract; we don't want to give them the exclusive power for all time to build subways in New York City; what we want is that the contract shall contain the routes of the subways which they are to construct, in order that we can be protected.

Mr. Lauterbach: For the coming season?

Mr. Nicol: Yes, sir. We want you to protect us, to see that they do not build a set of subways applicable to their companies, and not suitable to ours, and in that way wipe us out of existence. There are suggestions we desire to make in regard to routes, rules and rentals, and we want an adjournment of the matter for that purpose, for a week.

Senator Grady here made some further remarks in support of his position, and again spoke at a later stage of the consideration of the question.

Mr. Forster (representing Mount Morris Electric Light Company): We don't occupy at the present time, so far as this contract is concerned, any definite position either for or against the proposed contract, and for the reason we have never seen any contract whatever.

Wheeler H. Peckham, Counsel for the Standard Electrical Subway Company, addressed the Board at some considerable length in support of the proposal to give to his Company the contract for building the electric light and power subways.

Mr. Putney, who said that he was associated with Mr. Nicol, stated to the Board that he did not come before it to antagonize the proposition that there should be a contract, but that he disputed the propriety of the one proposed and desired to present some amendments to it.

Mayor Grant, at the close of the hearing and discussion, offered the following resolution:

Resolved, That the Board enter into a contract with the Standard Electrical Subway Company for the construction of subways for electric light and power conductors, in such streets and avenues in the city of New York as the Board may direct, and that the settlement of the terms and conditions of said contract be had at a meeting of this Board to be held on February 19th, 1890. at 12 o'clock, in the City Hall—each Electric Light and Power Company to submit in the meantime its proposed amendments to the form of the existing contract.

Unanimously adopted.

The foregoing resolution, after some discussion, and remarks by Senator Grady, was unanimously adopted.

Mayor Grant also moved the following resolution:

Resolved, That the Standard Electrical Subway Company be directed to build within the current year—and it be upon that condition that this contract is granted—subways in the following streets and avenues, heretofore recommended by the Board's Engineer in his Report of January 3d, 1890:

Whitehall street, from Battery place to Pearl street,
Broad, So. William and William streets, from Bridge street to New Chambers street,

Park Row, from Broadway to New Chambers street,
Washington street, from Fulton to Chambers street,
Greenwich street, from Battery place to West 12th street,
First avenue, from Houston to 130th street,
Second avenue, from Houston to 59th street,
Fourth avenue, from 14th to 34th street,
Sixth avenue, Carmine and Varick streets, from 14th to West Houston street,
Seventh avenue, from 14th to 45th street,
Eighth avenue, from 14th to 45th street,
Ninth avenue, from West 12th to 59th street,
Tenth avenue, from 14th to 59th street,
Eleventh avenue, from 14th to 59th street,
Battery place, from Greenwich to Whitehall street,
Bridge street, from Whitehall to Broad street,
Rector street, from Greenwich street to Broadway,
Liberty street, from West to William street,
Dey street, from West to Washington street,
Fulton street, from Broadway to South street,
Canal street, from West street to Bowery,
Houston street, from Greenwich to Hancock street,
8th street, from Sixth to First avenue,
14th street, from Sixth to Eleventh avenue,
23d street, from First to Fourth avenue,
29th street, from Broadway to Sixth avenue,
34th street, from First to Eleventh avenue,
42d street, from Broadway to Eleventh avenue,
59th street, from Eighth to Eleventh avenue,
80th street, from First to Third avenue,
Grand street, from Broadway to East River;

and this direction and resolution in no way to interfere with any future subways that may be ordered by the Board to be constructed by the Standard Electrical Subway Company.

Unanimously adopted.

Applications of the Mount Morris Electric Light Company, the United States Illuminating Company, the East River Electric Light Company and the North New York Lighting Company, respectively, for construction of subways in certain named localities, were, on motion of Mayor Grant, referred to Engineer Kearny, to report at the next meeting.

Commissioner Gilroy stated to the Board that he would grant permission to the Standard Electrical Subway Company by the first of March to commence the building of some of the subways which had been ordered, unless the weather changed very seriously.

Mayor Grant offered the following resolutions:

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company to string wires for individual telephone connections in territory where there is no subway, reported favorably upon by the Expert, be granted.

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated February 6th, 1890, to put two small aerial cables on pole line on 125th street between Lexington avenue and First avenue in place of the wires now thereon, be granted.

Unanimously adopted.

The Board, on motion of Commissioner Moss, hereupon adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, February 19th, 1890, at 12 o'clock, M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant: I have received objections to the proposed contract from only one Company—the North New York.

Senator Grady, on behalf of the East River Electric Light Company, stated that he joined Mr. Putney, of the North New York Company, in his objections.

Mayor Grant: Mr. Putney, as the sections are taken up that your amendments are applicable to, please call the attention of the Board to them.

Commissioner Hess: I think it is wise to go through the whole contract.

Mayor Grant: Read it.

The reading of the proposed contract was thereupon commenced, and had not far progressed, when Mr. Elihu Root, of counsel for the Manhattan Electric Light Company, appeared before the Board, and served on Corporation Counsel Clark, who was present—as representing the Board—a copy of an injunction order, signed by Judge Patterson of the Supreme Court, returnable the 26th instant, enjoining the making of the contract under consideration and the Consolidated Telegraph and Electrical Subway Company from making the transfer.

Mayor Grant: We can go on and discuss the terms of the contract?

Mr. Root: All that I want is that the thing cannot be actually consummated.

The Board now resumed the consideration of the proposed contract, taking it up article by article, discussing it and the proposed amendments, and listening to and considering suggestions and arguments in respect thereto by Mr. Peckham, of Counsel for the Standard Electrical Subway Company, Senator Grady, of Counsel for the East River Electric Light Company, Mr. Nicol, of Counsel for the Thomson-Houston people and the North New York Lighting Company, and Mr. Putney, associated with him, Mr. Forster, of Counsel for the Mount Morris Electric Light Company, Mr. Lauterbach, of Counsel for and President of the Consolidated Telegraph and Electrical Subway Company, and others.

The Board, after a lengthy discussion and hearing, finally adopted the following form of contract:

This agreement, made this day of February, 1890, by and between Hugh J. Grant, Mayor of the City of New York, Jacob Hess and Theodore Moss, as and constituting the Board of Electrical Control in and for the City and County of New York, created under and by virtue of an act of the Legislature of the State of New York, being chapter 716 of the Laws of 1887, passed June 25th, 1887, and the acts of which said act is amendatory, parties of the first part, and The Standard Electrical Subway Company, a corporation duly organized and existing under and by virtue of the laws of the State of New York, party of the second part.

Whereas, The said parties of the first part are authorized by said acts, as aforesaid, to cause to be devised a plan for the placing under ground of all electrical conductors in the City of New York, and to carry the same into operation and effect; and

Whereas, By an instrument dated the 7th day of April, 1887, Jacob Hess, Theodore Moss and Daniel L. Gibbens, as Commissioners of Electrical Subways, under and by virtue of an act of the Legislature of the State of New York, being chapter 499 of the Laws of 1885, passed June 13, 1885, as amended by chapter 503 of the Laws of 1886, passed May 29, 1886, entered into a contract with The Consolidated Telegraph and Electrical Subway Company for the building of subways for electrical conductors in the City of New York, and certain subways have been built by said The Consolidated Telegraph and Electrical Subway Company under said contract; and

Whereas, The said The Consolidated Telegraph and Electrical Subway Company, by an instrument of even date herewith, conveys to the Standard Electrical

Subway Company, with the consent and authority of the parties of the first part, and the approval of the Mayor and Counsel to the Corporation of the City of New York, all the subways, conduits and ducts for electric light and power conductors which it has constructed in said city, except the subways, conduits and ducts constructed for the use of the Edison Electric Illuminating Company of New York, and said The Consolidated Telegraph and Electrical Subway Company has applied to the parties of the first part for such a modification of its said contract as shall relieve it from the obligation to maintain, manage and operate the subways so conveyed, and from the further obligation to build subways for electric light and power conductors, except such as shall be constructed for the use of and occupancy by the Edison Electric Illuminating Company of New York, and the parties of the first part, by an instrument of even date herewith and with the approval of the Mayor and Counsel to the Corporation of the City of New York, have so modified said contract and The Standard Electrical Subway Company, party of the second part, to whom said electric light and power subways have been conveyed as aforesaid, desires to enter into a contract with the parties of the first part for the maintenance, leasing and management of said subways and the building of further subways for electric light and power conductors (except subways, conduits or ducts for the use of and occupancy by the Edison Electric Illuminating Company of New York) and for the owning, leasing, maintenance and management of such subways; and

Whereas, The said contract with the said The Consolidated Telegraph and Electrical Subway Company, for the reasons and in the manner set forth in the preambles and resolutions authorizing the execution of this contract, has become and is ineffectual for the carrying out of the just purposes of such contract and of the act of the Legislature of the State of New York, entitled "An Act in relation to Electrical conductors in the City of New York," passed June 25, 1887, and being chapter 716 of the Laws of 1887, and the making of this contract is deemed reasonable, advisable and proper for the purpose of carrying into effect the provisions and intent of said act;

Now, therefore, this agreement witnesseth, That, in consideration of the premises and of the mutual promises and agreements herein contained, and the sum of one dollar by each of the parties hereto to the other in hand paid, the receipt whereof is hereby acknowledged, the parties hereto agree as follows:

I. The party of the second part hereby agrees to provide, build, equip, maintain and operate, as herein provided, the subways for electric light and power conductors in this contract mentioned and referred to.

II. The subways aforesaid as The Standard Electrical Subway Company shall be directed by the party of the first part to build, shall be built in accordance with the plans and specifications therefor furnished or to be furnished by the parties of the first part, or their successors, and the same shall be provided, built, equipped, maintained, operated and kept in good repair by and at the cost of the party of the second part, who will, upon the reasonable demand of the parties of the first part, or their successors, adopt any and all necessary improvements that will increase the usefulness and efficiency of the system contemplated by this contract and the acts above referred to. The parties of the first part and their successors shall have the right, at any time, to make such modifications and changes as may be reasonably necessary in the said subways, or any of them, or the construction, plans, material, or any other matter connected with them, or any of them, or with the construction, maintenance or operation of them, or any of them, and the party of the second part shall conform to and carry out any changes or modifications so made.

III. The party of the second part shall, at its own cost, furnish to the parties of the first part, and their successors, any and all maps, working or other plans, profiles, surveys and drawings, made to scale or otherwise, and all accessible data, figures and information that may be requested by said parties of the first part, or their successors, and necessary, or deemed to be so, for any purpose relating to or connected with said subways, or the duties of the said parties of the first part, or their successors, in connection therewith or relation thereto, and shall also reimburse the parties of the first part, or their successors, for all reasonable expenses incurred by them in superintending and inspecting the construction of said subways.

IV. The spaces in said subways shall be leased by the party of the second part to any company or corporation having lawful power to operate electric light or power conductors in any street, avenue or highway in the City of New York that may apply for the same.

No space not actually needed for occupation by its electrical conductors in the due course of its business shall be leased to any company or corporation to the exclusion or detriment of any other company or corporation needing space in said subways, and desiring and able to pay for the same.

The said party of the second part shall, without charge, supply to the City of New York all space in said subways necessary for its electrical conductors and the electrical conductors of each separate department of said city which may now or hereafter be required.

If at any time the space in such subways shall not be sufficient for all the companies or corporations so applying for the same, or for the City of New York, or any of its departments, the additional space needed shall be provided by the party of the second part, at its own cost, by the construction, maintenance, equipment and operation of additional subways sufficient therefor, subject, however, to the same conditions and the same control by the parties of the first part, or their successors, as the original subways are by the terms of this contract and by any law.

The party of the first part hereby expressly reserves the right to permit any other company or corporation to build subways which it has not previously ordered the party of the second part to build, and reserves the right to make contracts and arrangements with any other party, company or corporation for the building of any subways in the City of New York other than those which at the date of this contract have been ordered to be built.

V. The party of the second part may fix a fair scale or rents to be charged according to the kind of conductors and the amount of space required therefor, which shall be at the same rate to all occupants making a like use of said subways, but the scale of rentals or any charges fixed or made by the party of the second part shall at all times be subject to the control, modification and revision of the parties of the first part, or their successors; and no contract shall be made between the party of the second part and any company or corporation on any terms which shall not require the payment by such other company or corporation of rents at the rates so fixed, or as modified by the Board of Electrical Control.

VI. Whenever the net annual profits of the party of the second part, remaining after the payment of the reasonable and necessary expenses of maintaining and operating such subways, shall exceed ten per cent. upon the actual cash capital invested by it in providing, constructing or equipping such subways, then the excess of such profit

over the ten per cent. shall be paid into the Treasury of the City of New York; but if, in any year or years prior to the earning of such excess, the earnings of the party of the second part shall not have equalled ten per cent., then the party of the second part shall be first entitled to recoup itself out of such excess for the difference between the actual annual earnings and the said ten per cent., the intention hereof being that the party of the second part shall have the right to earn and receive such ten per cent. for each and every year, and that no payments shall be made to the City of New York out of such excess of earnings until the party of the second part shall first have actually earned and received ten per cent. for each year theretofore. And the party of the second part shall and will, at all times, keep just, full and true books of account, which shall show in detail the transactions had by it, and with whom the same were had, and the nature thereof, and especially—

1. The amount of space in said subways occupied, with the names of the occupants thereof and the respective amounts of such space occupied by each occupant.

2. The number and kind of electrical conductors therein, with the names of the owners or users thereof.

3. The gross and net amount in detail of rentals and charges and moneys of all kinds collected or received by the party of the second part, and from whom and for what the same were received or collected, specifying the names of those paying such moneys, and the cause or consideration of such payment in detail.

4. All payments of every kind made by the party of the second part, specifying in detail and separately each payment and to whom the same was made and the cause or consideration thereof, so as to show specifically the nature thereof, so that it may be determined whether the same is chargeable to the cost of construction or of maintenance.

And said books and accounts, and all the books, accounts, papers and writings of the party of the second part shall at all times be open to the inspection of the parties of the first part, or their successors, and of the Comptroller of said city, or any person or persons by him or them deputed to examine the same, and they or he may copy the whole or any part thereof.

And the said party of the second part shall and will, on the first day of October of each year, make and return a statement to the Comptroller of the City of New York, in such form and verified as he may require and prescribe for the year ending the next preceding first day of September. And any moneys payable to the City under this clause of this agreement, by the party of the second part, shall be paid annually on the first day of November.

VII. The party of the second part shall not open any street surface without first obtaining a permit therefor from the Commissioner of Public Works, or other officer or department of said city vested by law with the control of the surface of the street to be opened, and giving to him or it such an agreement as he or it may approve and require for the proper restoration of the pavement of said street and the surface thereof, and for keeping the same in repair for one year after the same has been so replaced or restored.

VIII. The party of the second part shall not be deemed to be the servant or agent of the parties of the first part or their successors, or of the Mayor, Aldermen and Commonalty of the City of New York, in doing any act under or in execution

or performance of this contract, but shall be deemed to be, and is hereby intended to be, made and dealt with by the parties of the first part and their successors, and all persons whomsoever as an independent party contracting with the parties of the first part, and their successors and others, and having and acquiring such rights for itself as this contract secures to it.

IX. All companies occupying space in said subways shall own their own conductors and shall have the full management and control thereof, except where otherwise mutually agreed upon between the said party of the second part and said companies, subject to the approval of the parties of the first part, or their successors; but said management and control shall be subject to the rights of all other occupants of said subways, and to such reasonable rules and regulations as may be made by the said party of the second part with the approval of the party of the first part. All maintenance and repairs of such conductors shall be done by the company owning them, under the supervision of the party of the second part, who shall prevent injury to the conductors of other occupants.

X. In case any dispute shall arise between the party of the second part and any company occupying or desiring or requiring to occupy said subways, the same shall be referred to the parties of the first part, or their successors, for settlement, whose decision shall be final.

XI. The party of the second part shall give a bond to the parties of the first part and their successors in the penal sum of Two hundred and fifty thousand dollars, with good and sufficient sureties satisfactory to the parties of the first part, or their successors, securing the just and full performance of this contract and the building or providing of said subways as herein provided, and securing said parties of the first part and their successors and the Mayor, Aldermen and Commonalty of said city well and safely against any and all patent and other suits arising from the building and operation, use and maintenance of said subways, or of any subways, provided by the party of the second part, whether the same now or shall hereafter be built by it, and in the case of the insolvency or death of either of the sureties upon such bond the party of the second part will, upon the request of the parties of the first part, or their successors, give a new bond to the same tenor and effect, and subject to approval the same as the bond so originally to be given. The said bond shall also contain a guarantee to the City of New York for any and all damages to said city by reason of the construction of said subways.

XII. If at any time, in the opinion of the parties of the first part, or their successors, there shall be a substantial failure by the party of the second part to fully carry out the provisions of this agreement, and it is so adjudged by competent judicial authority, the Mayor, Aldermen and Commonalty of the City of New York may enter into the possession of such subways, and the party of the second part shall, subject to any valid mortgages or liens then thereon outstanding, not exceeding fifty per cent. on the actual cost of such subways, and all leases or contracts then existing for the use thereof, as hereinbefore provided, forfeit its interest in such subways, and will quietly and peaceably surrender the possession thereof to the Mayor, Aldermen and Commonalty of the City of New York, who shall thereupon and thereafter hold and own the same, subject, however, to the same powers and duties of the parties of the first part, or their successors, as the same would otherwise have been held subject to by the party of the second part, and the same, until otherwise provided by law, shall be maintained and operated by the said Mayor, Aldermen and Commonalty of the City of New York, by and through the parties of the first part, or their successors, subject to such lawful liens, mortgages, leases and contracts.

XIII. The parties of the first part hereby grant to the party of the second part the right to build subways as the parties of the first part shall order the party of the second part to build for electric light and power conductors in accordance with such plans and specifications as shall at any time be furnished by the parties of the first part, as hereinbefore provided, and said parties of the first part hereby agree to use all lawful means within their power to compel all authorized companies or persons using electric light or power conductors to comply with the provisions of law and to place their conductors in said subways and to pay a fair rental for the space therein, but neither the parties of the first part, nor their successors, nor the Mayor, Aldermen and Commonalty of the City of New York shall be liable or responsible for any neglect or failure on the part of any such company or person so to place their conductors in said subways, or, having placed their conductors therein, to pay the fair rental for the space occupied by him or it; nor shall the Mayor, Aldermen and Commonalty of the City of New York be liable for any neglect, failure or refusal in the premises of the parties of the first part, or their successors.

XIV.—The successors of the parties of the first part shall be construed to include those who may succeed them as Commissioners under the provisions of existing laws, or under the provisions of any law hereafter passed by the Legislature of the State of New York, or any officer or officers of the City of New York who shall succeed to the powers and duties of the parties of the first part, or any part of such powers and duties under the provisions of any law now existing or hereafter enacted by the said Legislature, or any other persons or officers hereafter appointed or selected pursuant to any law, to succeed to the powers and duties, or any part thereof, of said parties of the first part.

XV. The said party of the second part shall, at any time after January 1 (1897) eighteen hundred and ninety-seven, upon the demand of the Commissioners of the Sinking Fund in the City of New York, by proper instrument or instruments of conveyance or transfer, in due form and duly executed, sell, assign, transfer, convey and set over to the Mayor, Aldermen and Commonalty of said city, the subways constructed by it, as aforesaid, and all or any of the contracts or other property of any kind held or owned by the party of the second part, for any of the purposes of its incorporation, subject, however, to all leases, mortgages or contracts theretofore lawfully made, within the limitations imposed by section XII. of this contract, when the said Commissioners of the Sinking Fund shall request them to, and for the payment for which the said Commissioners of the Sinking Fund shall provide, as provided by any law hereafter passed, but not less than the cost thereof; and if the said Company shall not have earned ten per cent. per annum on actual cost during the term of this contract a further payment shall be made, in addition to the cost, not exceeding ten per cent. on such cost, to the extent of such deficiency in actual earnings.

XVI. This agreement shall not bind either of the parties thereto, unless and until the bond hereinbefore mentioned and required to be given by the party of the second part shall be given within ten days hereafter, or within such further time, not to exceed twenty days additional, as may be granted for that purpose within said ten days by said parties of the first part or their successors.

Nothing in this contract shall be construed as granting to the party of the second part any exclusive privilege, immunity or franchise whatsoever.

XVII. The subways for electric light and power conductors, conveyed to the

STATE OF NEW YORK,
CITY AND COUNTY OF NEW YORK, } ss.:

On this day of February, 1890, before me personally appeared , to me known and known to me to be the President of the Standard Electrical Subway Company, who, being by me duly sworn, did depose and say: That he was such President; that he knew the corporate seal of said Company; that the seal affixed to the foregoing instrument is the seal of the said Company; that he affixed the same by order of the Board of Directors of the said Company, and that he signed the name of the said Company by himself as President by the like order, and that was the Secretary of the said Company, and signed his name in attestation thereof by the like order.

Mayor Grant: Unless there be some further amendment to be added, this contract will be the contract that this Board is to adopt, if it is permitted by the court so to do. Of course, we cannot take any action now.

Mayor Grant offered the following resolution, first stating in reference thereto, that it was offered as a substitute for the resolution adopted at the last meeting, was in no way to interfere with the injunction order served upon the Corporation Counsel here to-day, and is not to be considered as in violation of it, but is simply intended to perfect the record on the subject:

Whereas, Recent events have rendered it necessary to provide as speedily as possible subway accommodations for electric light and power conductors in the City of New York, to the extent of many hundred miles of ducts extending over the entire city; and

Whereas, Comprehensive plans for the building of such subways, and of subways for telegraph, telephone and other purposes have been adopted by this Board; and

Whereas, The utmost expedition in carrying out the plans so adopted is of great public importance, and it is probable that the Consolidated Telegraph and Electrical Subway Company will be unable, by reason of the magnitude of the work to be performed and the exceedingly short period of time within which it should, if possible, be done, to complete the same as rapidly and expeditiously as it would be done if the work were divided; and

Whereas, The said Consolidated Telegraph and Electrical Subway Company is willing, if in the opinion of this Board such course shall be desirable, that the duty to build and the right to build such subways and conduits as may be ordered for electric light and power purposes (except subways and conduits for the use of the Edison Electric Illuminating Company of New York) shall devolve upon some other company, and that the work to be performed by the Consolidated Telegraph and Electrical Subway Company shall be the construction of other conduits except the conduits for electric light and power conductors other than those for the use of the Edison Electric Illuminating Company of New York; and

Whereas, The Consolidated Telegraph and Electrical Subway Company is

willing to sell and transfer to some other company, on terms to be agreed upon, or to be fixed by proper arbitration, the subways, conduits, ducts, house and other subsidiary connections constructed or in process of construction, in the City of New York, for the use of electric light and power conductors (except the subways, conduits and ducts constructed for the use of the Edison Electric Illuminating Company of New York), provided that said the Consolidated Telegraph and Electrical Subway Company shall, by an agreement between this Board and said Company, be relieved from its duties and obligations under existing contracts with respect to the subways and other property so sold and transferred, and that the right of said the Consolidated Telegraph and Electrical Subway Company to build subways, conduits and ducts for electric light and power conductors under said agreements except as aforesaid, shall be surrendered, and the duty of building, maintaining, operating and leasing of such subways, conduits and ducts as may be ordered to be built by the Standard Electrical Subway Company for electric light and power conductors (except subways, conduits and ducts for the use of the Edison Electric Illuminating Company of New York) shall be assumed by such other company by an agreement with this Board; therefore

Resolved, That in the opinion of this Board, in view of the extraordinary emergency with which this Board is called upon to deal, it is expedient, reasonable and proper that such division be made of the work to be performed as is proposed, and that a further contract or contracts be made with some person or persons, corporation or corporations for the construction of subways for electric light and power conductors in such form and to such effect as may be approved by this Board.

Resolved, That the existing contracts between this Board and the said the Consolidated Telegraph and Electrical Subway Company be modified so that the said last-named Company shall be relieved from its liabilities and obligations and shall lose its right with respect to the building, maintenance, operation and management of the subways proposed to be sold as aforesaid, and of subways hereafter to be constructed for the use of electric light and power conductors (except the Edison subways and ducts as aforesaid), and that a sale and transfer as proposed and upon the conditions above mentioned be approved by this Board, and that a further contract be made with the Standard Electrical Subway Company for the building, maintaining, operating and leasing of such subways, conduits and ducts as may be ordered it to build for electric light and power conductors (except subways, conduits and ducts for the use of the Edison Electric Illuminating Company of New York), similar in general terms and provisions to the contracts now existing between this Board and the Consolidated Telegraph and Electrical Subway Company, and that the Counsel to the Corporation be requested to prepare such contracts to be executed by this Board as shall carry into effect these resolutions.

Unanimously adopted.

The Board here took up the consideration of the proposed rules for overhead wires, listened to their reading and exposition, together with proposed amendments, by Expert Wheeler, heard arguments from Mr. Leslie, of the Manhattan Company, and Mr. Moore, of the East River Company, in support of amendments, and suggestions from others, and finally adopted as its rules and regulations for overhead wires the following:

RULES AND REGULATIONS FOR OVERHEAD WIRES.

Unanimously adopted February 19, 1890, to take effect immediately, superseding all other rules.

Wires are divided into two classes—First Class, those for telegraph, telephone, etc.; Second Class, those for electric light and power.

POLES.

1. Two lines of poles bearing conductors of a like class shall not be erected on any street or avenue.
2. Two lines of poles shall not be erected on the same side of any street or avenue.
3. Poles shall be set in the sidewalk about twelve inches from outside of curb, and no pole shall be placed within ten feet of any lamp-post or other pole, except at street corners where necessary in order to support wires running on the cross street.
4. All poles now standing, or erected hereafter, shall be branded or stamped with the initials of the company owning them, at a point not less than five nor more than seven feet from the street surface; and when a pole is occupied by wires belonging to more than one company, each group of cross-arms, or, where necessary, the support of a single wire of different ownership, must be distinguished by some characteristic paint, mark or fastening.
5. Electric light lamp-posts shall be in accordance with a plan approved by the Board.
6. All poles carrying more than two wires shall be at least forty-five feet high, uniform in size, straight and painted from top to bottom—a very dark color from the sidewalk to a point eight feet high, and a dark green color above that.
7. All poles for carrying not more than two wires shall be twenty-five feet high, straight, uniform in size, and painted from top to bottom—a very dark color from the sidewalk to a point eight feet high, and a dark green color above that.
8. Cross-arms shall be uniform in length, strengthened by braces, and painted the same color as the poles, the cross-arms of each company being distinguished by some characteristic mark.
9. Each line of poles must be run on one side of the street only, except when absolutely necessary to change to the other side; but this to be done only by the permission of the Board or of its Engineer or Expert.

10. Poles shall be uniformly spaced, and about sixty to the mile. This requires, on the short city blocks of two hundred and sixty feet, alternately three and two poles to the block.

11. Conductors must not be placed upon fixtures erected or maintained for supporting wires of the other class, except at crossings when approved by the Expert.

12. All existing regulations of the local authorities in regard to the placing of poles and stringing of wires are to continue in force, except when in conflict with these rules; and the Rules and Regulations of the New York Board of Fire Underwriters must be strictly observed.

13. When any company is permitted to erect poles, or other fixtures bearing lamps for the purpose of lighting the streets or public places of the city, the permission is subject to the following provisions, which are expressly made a condition of said permits. Whenever the contract for lighting any such public places shall be given to another company, the company who erected said lamp-posts shall, on tender of the first cost thereof yield possession of the same to the other company obtaining the new contract, except in cases where the company owning the lamp-posts prefers to remove them.

14. All broken and "dead" wires, and all wires, poles and fixtures not actually in use—subject to Rule 28—must be removed. When a pole is taken down it must be removed from the streets the same day. New poles must not be brought upon any street more than two days in advance of their erection. Any pole that shall lie in any street more than two days shall be removed by the Department of Public Works, at the expense of the party owning it.

WIRES.

15. All wires shall be fastened upon poles or other fixtures with glass, porcelain or rubber insulators, approved by the Expert, and must be stretched tightly and fastened with a strap of the same kind of wire, or other fastening approved by the Expert.

16. No wire shall be stretched within four inches of any pole, building or other object, without being attached to it and insulated therefrom. Any company refusing permission to make such fastening to its poles shall be judged guilty of violating this rule. All wires strung on housetops must be nine (9) feet clear of roof.

17. No wire shall hang within twenty feet of the pavement at the lowest point of sag between supports, except where required to reach a lamp or other connection, and must then be protected by extra covering and be rigidly fixed and out of the way.

18. Every line, pole, fixture, etc., must be kept in thorough order, repair, and conformity with these rules and specifications, upon penalty of forfeiture of all permits not actually acted upon and a refusal to grant new permits until the rule is complied with, but no additional poles or wires can be erected under cover of repairs, nor shall any route or location be changed without a permit.

ELECTRIC LIGHT AND POWER WIRES.

19. All electric light conductors shall be secured to insulating fastenings, and covered with an insulation which is water-proof on the outside and not easily worn by abrasion. Whenever the insulation becomes impaired it must be renewed immediately.

20. All joints must be as well insulated as the conductors, and the insulation of joints must be maintained. A rigid insulating sleeve clamped over the joint is preferred.

21. Every wire must be distinguished by a number plainly marked on each cross-arm under the insulator. Day circuits must be conspicuously distinguished. All arc lamps must be so placed as to leave a space underneath of nine (9) feet clear between lamp and sidewalk.

22. Every line entering a building shall be controlled by a cut-off placed near the entrance, in sight and easily accessible.

23. In the construction of lines the insulation to be used must be approved by the Expert of the Board in writing, and when new the insulation must not be less than thirty megohms per mile per 1,000 volts. The insulation must always be maintained, even in stormy weather, above a minimum of one-fifth megohm per mile per 1,000 volts, and if any circuit falls below this standard, the current must be discontinued until the insulation is restored. Under no circumstances shall Underwriters' wire be used.

24. All connections with lines of electric light conductors shall be had at right angles to the line where possible; and connections to buildings shall be run straight across to the building, and then down the front of the building.

25. The insulation must be preserved throughout the entire circuit, and if any portion of a lamp or fixture is a part of the circuit and can be touched, it must be insulated.

26. All conductors shall have a resistance uniformly distributed of not more than seventy nor less than twenty ohms per mile per ampere, and proportionately less for heavier currents.

27. All circuits must be tested every hour, and when a ground comes on, effort must be made to remove it at once. Failing in this, the current must be discontinued until the insulation is restored.

28. No unused loops from electric light circuits shall be allowed to remain after lamps are taken away, except in cases where it is positively known that the lamp will be required again within three months, and where there is no underground conduit for that class of circuits. When allowed to remain the joint in the loop must be as well insulated as the line itself.

29. From and after date no company shall do business of electric lighting in the City of New York without a certificate of the Board in cases where it is considered necessary by the Expert of the Board, granted on the recommendation and after inspection by the Expert, to the effect that its lines comply with all the Rules and Regulations of the Board, and that its plant is in proper condition for the doing of its business. The force of the certificate to continue until changes are made, of which the Board must be notified and approve, or so long as the plant and conductors remain in the same condition as when inspected.

LINEMEN.

30. Every lineman must wear rubber gloves always when at work, and must wear a badge in a conspicuous place, giving his number and the name of the company by whom he is employed.

PERMITS.

All companies are authorized and directed to make necessary repairs to their lines of conductors. The general permit under which this may be done does not, however, cover the erection in any street, avenue or highway of any additional poles, wires or other similar fixtures, and has absolutely no reference whatever to lines which have been ordered underground by the Board, and which the Mayor has been requested to remove.

In the case of such lines, where notice has been given that underground accommodations have been provided, and the ninety days of notice required by law have elapsed, and the Mayor has been requested to remove the same, companies owning or operating said lines are not authorized to make any repairs or connections or to go upon the poles bearing such lines for any purpose whatever, except to remove the said lines of electrical conductors in conformity with the directions of the Board.

32. The Secretary is authorized to issue to companies operating electrical conductors all permits required by them for the making of connections not requiring more than 125 feet of wire necessary to the business of said companies with lines now in use, and which the Mayor has not been requested to remove, upon the certification of the Expert that there is no subway in the street in question for this class of conductors. Said connections to be in every case in accordance with the Rules and Regulations of the Board.

33. All permits of the Board for overhead wires and fixtures are granted only pending the providing of underground accommodations in the neighborhood of the street or avenue for which the permit is granted.

34. Any member or officer of the Board, and every inspector employed by it, as well as every member of the police force of the city, shall be entitled to examine permits under which work of any kind is being done.

35. No permit shall be granted for the erection of any overhead structure nor for the renewing of any lines already existing in any street in which underground accommodations for the service have been provided, and the ninety days' notice required by law has elapsed.

36. The violation of any of the rules and regulations of the Board shall operate ipso facto as a revocation of the permit held by the company or person guilty of such violation.

37. Every company or person erecting poles, wires or fixtures must make and leave, at least once each week, at the office of the Board, such records of the fixtures, etc., which they are erecting, and of all of the same that they have in use, as are required by the Engineer and the Electrical Expert of the Board, and in such form as shall be prescribed by them.

38. The companies or persons owning or controlling poles in any street or avenue shall allow the same to be used by other companies or persons operating conductors for similar electrical service when authorized so to do by the Board on tender of proper compensation, to be determined by agreement between the parties interested. In default of such an agreement the amount of such compensation shall be determined by the Board. This rule imports a contract on the part of each company or person owning or controlling the poles on any street or avenue, not only with the Board, but also with each company or person who shall, under its terms, be qualified to demand the privileges it confers, to permit this joint use of poles.

And in accepting any permit the applicant thereby binds himself to this agreement.

Mayor Grant offered the following resolution:

Resolved, That the proposed rules and regulations for overhead wires, as amended, be adopted as the rules and regulations of this Board, take immediate effect, and supersede all other rules.

Unanimously adopted.

The following communication was read:

THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY CO.,

18 CORTLANDT STREET,

NEW YORK, February 18, 1890.

To the Commissioners of the Board of Electrical Control:

GENTLEMEN:—We beg leave to submit herewith the enclosed drawing showing proposed addition to the system of ventilation of the system of electrical subways. These additions consist of stand-pipes leading from manholes at points where experience shall from time to time show that they are needed to relieve the excessive accumulation of gas in the subways. We, therefore, submit this plan to your Honorable Board, requesting your favorable consideration and authorization of the same.

Very truly yours,

EDWARD LAUTERBACH, President.

Engineer Kearny: I recommend the granting of the application of the Consolidated Company to use these stand-pipes.

Mayor Grant moved the following resolution:

Resolved, That the application of the Consolidated Telegraph and Electrical Subway Company, dated February 18, 1890, to use stand-pipes leading from manholes for ventilation, in accordance with a plan submitted with said application, be granted, provided, however, that the number of places sought to be thus ven-

tilated shall not exceed six until such times as the Board shall further act in the matter.

Unanimously adopted.

A communication from the Edison Electric Illuminating Company, dated February 13, 1890, addressed to heads of all city departments, was ordered to be placed on file.

A communication from the Mercantile Safe Deposit Company, dated February 18, 1890, with reference to its application before the Board to enter the subway, was brought up, and, together with the application, laid upon the table.

Mayor Grant offered the following resolution:

Resolved, That the applications before the Board of the Metropolitan Telephone and Telegraph Company for individual telephone connections which are in territory where there is no subway and reported favorably upon by the Expert be granted.

Unanimously adopted.

An application of the Western Union Telegraph Company, dated February 15, 1890, to string two wires on the poles of the Fire Department through Eighteenth street, from the Sixth avenue elevated structure to Chickering Hall was denied, on the ground that there is a subway in Eighteenth street through which the Company is able to make the desired connection.

The following communication was read:

NEW YORK, Feb. 18th, 1890.

HON. THEODORE MOSS, Sec. Board of Electrical Control:

DEAR SIR:—I herewith tender my resignation as Clerk of Record of Electrical Conductors to the Board of Electrical Control, to take effect February the 24th inst.

Very respectfully,

MALCOLM S. KEYES.

Mayor Grant offered the following resolution:

Resolved, That the resignation of Malcolm S. Keyes as Clerk of Record of Electrical Conductors, to take effect February 24th instant, be accepted.

Unanimously adopted.

An application of the Mount Morris Electric Light Company, dated February 15, 1890, to re-connect four circuits at Fifty-ninth street and Ninth avenue, was granted.

Mayor Grant offered the following resolution:

Resolved, That the application of the Metropolitan Telephone and Telegraph Company, dated February 17, 1890, to transfer fifty wires from the Willis avenue pole line, between Harlem River and 146th street, the 146th street pole line, between Willis and St. Anns avenue, and the St. Anns avenue pole line, between 146th street and 163d street, to the pole line on Third avenue between the Harlem River and 125th street and the Harlem River and 163d street, be granted, on condition, however, that the poles on Willis avenue be taken down.

Unanimously adopted.

Applications of the Edison Electric Illuminating Company for lamp connections, reported favorably on by the Expert, were granted.

The Board adjourned until Friday, February 21st, 1890, at 3 o'clock P. M.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday, March 7th, 1890, at 3.30 o'clock P. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant: This meeting is called to consider certain charges Dr. Wheeler has to prefer against certain inspectors.

Commissioner Hess: There is a resignation here from one of them.

Inspector Roth's resignation, as follows, was hereupon read:

NEW YORK, March 7th, 1890.

Board of Electrical Control:

GENTLEMEN:—I hereby tender my resignation as Inspector of Electrical Control.

Respectfully,

GEORGE W. ROTH.

And Mayor Grant offered the following resolution:

Resolved, That the resignation of George W. Roth as Inspector of Electrical Conductors of the Board of Electrical Control be accepted.

Unanimously adopted.

The Board ordered the following statement to be spread on the minutes:

OFFICE OF THE BOARD OF ELECTRICAL CONTROL OF THE CITY OF NEW YORK.

The dismissal of Inspector Christopher P. Reilly from the employ of the Board is hereby recommended for neglect of duty and misconduct in discharging the same as specifically appears by particulars submitted herewith, and upon the following grounds:

First. Said Reilly has uniformly been in the habit of reporting at the office of the Board at the usual time and thereafter leaving said office and neglecting to perform the inspections and other specific duties required by the Board, proceeding about the city to various places and remaining away for considerable lengths of time, upon business or errands which had no connection whatsoever with the business of the Board on which he was employed, and, after wasting substantially the entire day in this manner, reporting at the office at night as if he had attended to his duty during the same.

Second. That said Reilly has failed to report regularly to and remain constantly with the gangs of the Bureau of Incumbrances, Department of Public Works, as specifically directed to do by the Board of Electrical Control, for the purpose of pointing out to said gangs the wires and so forth which were to be removed; in consequence of which the work of the Board of Electrical Control and the Department of Public Works has been seriously retarded.

Third. That said Reilly has not only frequently failed to make correct reports when directed so to do, but, by pretending to have done so, has thereby led the Expert of the Board, who was obliged to rely upon him, to act and report upon a false statement of facts, as a result of which his work and that of the Board has become seriously confused and demoralized and its effectual performance has become impossible and will so continue unless said Reilly is discharged.

Dated March 7, 1890.

Respectfully submitted,

THEODORE MOSS, Secretary.

Expert Wheeler stated that he had suspended Inspector Reilly, and at the time of such suspension he had given him notice that at the next meeting of the Board charges would be preferred against him.

The Board discussed the question of the sufficiency of the notice to Inspector Reilly, and, pending its consideration, a telephonic communication was received from him stating that he would appear before the Board in half an hour; and, on motion of Mayor Grant, a recess was taken for half an hour, in order to give Inspector Reilly a chance to be heard on the charges preferred against him.

The Board, at the expiration of the half hour of recess, reconvened.

Mr. Reilly's name was called, at which there was no response, he not being present, whereupon

Commissioner Moss moved the following resolution:

Resolved, That the charges against Christopher P. Reilly, Inspector of Electrical Conductors, be sustained, and that he be dismissed from the employ of the Board of Electrical Control.

Unanimously adopted.

Commissioner Hess offered the following resolution:

Resolved, That the Electrical Expert of the Board be and he is authorized and directed to appoint four Inspectors of Electrical Conductors for temporary duty for thirty days.

Unanimously adopted.

Adjourned sine die.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Saturday, March 22d, 1890, at 10.30 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant: Mr. Dean will make a statement here about the injunction case that was before the court.

Mr. Dean (Assistant Corporation Counsel): On application to Judge Andrews to settle the order vacating the injunction, on application of the other side, he has added a proviso that nothing shall be done under the order vacating the injunction until the hearing and decision of an appeal at the General Term, the General Term having agreed to meet on either Wednesday or Thursday of next week and hear the appeal.

Mayor Grant: That being the case, this Board cannot take any action until such time as an order vacating said injunction is served. This meeting is a special one called for that purpose, and I cannot conceive that there is any other business.

Samuel B. Clark appeared before the Board and made the following statement:

"If the Board please, I have one or two matters I would like to present on behalf of the Harlem Lighting Company, in reference to their general business."

Mayor Grant: This is a special meeting, and as we have to adjourn at 12 o'clock, we cannot take up any other business.

Mr. Clark: I ask permission to lay the matter before the Board.

Mayor Grant: What is it about?

Mr. Clark (continuing his statement):

"First, in regard to the ducts on Third avenue above Fifty-ninth street, in regard to which the Board has ordered the Harlem Lighting Company to remove its overhead system; that Company has proceeded to obey the order of the Board, and has made its preparations, and has got its cables, and is ready to enter the ducts there. It has made application to the Consolidated Telegraph and Electrical Subway Company for permission to enter the ducts; that application has not been acted on, and we wish to lay that matter before the Board, and ask to have space in these subways."

Mayor Grant: Is there anybody here representing the Consolidated Telegraph and Electrical Subway Company?

Mr. Clark: We served notice of that application on this Company.

Mr. Ridgway (Vice-President Consolidated Telegraph and Electrical Subway Company): The applications for ducts are made to the Chief Engineer of our Company. I will inquire into the subject and see what there is in it.

Mr. Clark: I will lay this formally before the Board in the form of a letter.

Mr. Clark thereupon presented to the Board the letter referred to by him, dated March 21st, 1890, and

Mayor Grant offered the following resolution:

Resolved, That the letter of the Harlem Lighting Company, dated March 21st, 1890, and the matters therein referred to, be referred to Engineer Kearny, to report at the next meeting.

Which was unanimously adopted.

Senator Grady, on behalf of the East River Electric Light Company, presented to the Board an application of the same character as that of the Harlem Lighting Company, and

The Board, on motion of Mayor Grant, also referred this application to its Engineer.

Ex-Commissioner Gibbens appeared before the Board, and stated that there were certain applications before the Commission for which he appeared, represent-

ing certain companies, and asked, on behalf of his clients, that some early day be set when the Board would meet, so that these applications may be acted on.

Mayor Grant hereupon moved the following resolution:

Resolved, That the Board adjourn to Wednesday, March 26th, 1890, at 11 o'clock, A. M.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, March 26, 1890, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioner Jacob Hess, Commissioner Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant called the attention of the Board to the following communication of the East River Electric Light Company:

NEW YORK, March 24th, 1890.

HON. HUGH J. GRANT, HON. JACOB HESS, HON. THEODORE MOSS, constituting the Board of Electrical Control:

GENTLEMEN:—The East River Electric Light Company respectfully enters its protest against the high rates of rental charged for the use of ducts for electric light conductors used by it and which it may use in the course of its business.

We at one time had a contract with the City of New York for public lighting on Sixth avenue; when the overhead conductors were removed we could not continue the lighting on account of the high rental for ducts; it being in that case a charge of more than fifty dollars per lamp per year, the price paid by the city being \$127.75; to the rental must be added the cost of making subsidiary lamp connections, which cost about \$75 for each lamp, making a total charge for the underground connection of at least \$125 per lamp for the first year, exclusive of the great cost of underground conductors and the additional expense of making tests, as required by the rules of the Consolidated Company, which latter charges enter into the cost every year.

From these figures you can see that electric street lighting, where there is only a small commercial business to be done in connection with it, if the present rentals are to continue, cannot be done only at greatly increased cost to the city; the same applies to light used by the citizens of New York in the conduct of their business.

That the present rentals are exorbitant and unjustifiable may be proven by statements made by the Consolidated Company through its counsel, Mr. Cohen, in open Court before Judge Andrews, that the present cost of the electric light ducts was

\$1,640,000, and we find on page 11 of the third annual report of the Board of Electrical Control, adopted January 8th, 1890, that the number of miles of electric light ducts to date is 454, making the cost per mile of duct \$3,612.11; Mr. William Maver, Jr., the electrician of the Consolidated Telegraph and Electrical Subway Company, stated recently at a meeting of the American Institute of Electrical Engineers held in this city, that the average cost of ducts was about \$3,000 per mile. And these costs are for work which was largely experimental and in difficult and trying places. It is fair to assume that the construction in the future will be more economically performed and less difficult to do. This cost, too, it must be remembered, includes a profit of 15 per cent. on the actual outlay of the sub-contractors, and an additional profit of 15 per cent. on the sub-contractor's bill to the Phoenix Construction Company.

The City of New York is the greatest user of electric lights; it consumes fully one-fourth of all the arc lights in operation here. The present number is only a small fraction of its probable needs as the value of electric light for protection to life and property is so great that the demand for its more general use will increase in fair proportion to the progress of the city in wealth, intelligence and good government.

We have been reliably informed by Mr. Caleb H. Jackson, of the Standard Electrical Subway Company, that a three-inch duct is rented and maintained in Philadelphia for \$250 per mile per year.

On October 14th last in a communication to your honorable Board, Mr. Wheeler H. Peckham, representing the Standard Company, and Mr. Paul D. Cravath, representing the Brush and associated companies, presented in writing a proposition that if permitted by your honorable Board to build subways, the rent should not exceed \$750 per year per mile.

In all ranks of life and all branches of business existing to-day electricity is demanded for light and power. Under the present rentals it cannot be distributed at a price to bring it within the reach of consumers.

We ask a prompt and speedy relief at the hands of your honorable Board.

Yours very respectfully,

EAST RIVER ELECTRIC LIGHT COMPANY.

The Board discussed the communication of the East River Electric Light Company at considerable length, and questioned Judge Kelly of the Company in regard to its statements, at the conclusion of which,

Mayor Grant offered the following resolution:

Resolved, That the communication of the East River Electric Light Company, dated March 24, 1890, protesting against the rates of rental charged for the use of ducts for electric light conductors, be referred to the Engineer of the Board, to take testimony in respect thereto and report the same to the Board.

Which resolution was unanimously adopted.

Mayor Grant: There is another communication here from the East River Electric Light Company in respect to the existing rules of the Consolidated Telegraph and

Electrical Subway Company governing underground electric light conductors that I have referred to the Electrical Expert. Dr. Wheeler, what have you got to say on that subject?

Dr. Wheeler: This letter does not specify what rules are objectionable to them or reasons why objectionable. I would like to hear what the objections are, and I would like to have a little time to go over the subject and consider it.

Judge Kelly (of the East River Company): If that matter is referred to the Electrical Expert, that is satisfactory.

Mayor Grant then moved the following resolution:

Resolved, That the communication of the East River Electric Light Company, dated March 22d, 1890, and the matter therein complained of, be referred to Expert Wheeler.

Unanimously adopted.

The following communication, which was referred to the Engineer of the Board at its last meeting, was read:

MARCH 21st, 1890.

To the Honorable, the Board of Electrical Control:

GENTLEMEN:—Subways having been constructed on Third avenue between 80th and 130th streets, this Company was directed by your Board on January 8th last to remove its overhead system of poles and wires there, within ninety days.

This Company thereupon proceeded to make the necessary preparations for removal in the way of obtaining cable for use in the subways.

On March 6th inst. the cable being then about ready for delivery, we made application in the usual form, and in accordance with the rules of the Consolidated Telegraph and Electrical Subway Company to that Company for one distributing duct and two trunk ducts on Third avenue between 80th street and 125th street, and for one distributing duct between 125th and 130th streets.

No action has been taken by the Consolidated Telegraph and Electrical Subway Company on our application, and no space in the said subways has been allotted to us.

The subways constructed on Third avenue between 80th and 130th streets contain about twenty ducts; none of them are occupied. Their capacity is sufficient to supply all the electric light and power facilities needed in the upper part of the city at present and all the facilities that are likely to be needed for several years to come. No other Company than ours now has any system of electric light wires on Third avenue between 80th and 130th streets, nor does any other Company stand in such immediate need of space in the subways there.

This Company is further embarrassed by the fact that the manufacturer of our cable has notified us that we must remove at least a portion of the cable from its premises at once, as the weight upon its floors is so great that there is danger that they may break down.

This Company therefore directs the attention of the Board to the matter and requests that facilities for its business may be furnished to it forthwith, in the said subways on Third avenue between 80th and 130th streets.

We beg also to direct the attention of the Board to the fact that by reason of the delay in granting our application for space in the said subway, it will be impossible to complete the work of transferring our system at the place indicated from overhead to underground by April 8th, the time when the ninety days limited in the Board's order of January 8th will expire, and we therefore request that our time to comply with the order of January 8th may be extended for a reasonable length of time after ducts shall be assigned to us.

It is our wish and purpose to make the change as ordered by the Board, and the Board may rest assured that it will be made within the shortest possible time after the necessary opportunities shall have been given to us.

We send a copy of this letter to the Consolidated Telegraph and Electrical Subway Company with notice that it will be presented to the Board at its next meeting.

Very respectfully,

THE HARLEM LIGHTING CO.,

By E. A. LESLIE.

Whereupon Engineer Kearny submitted the following report:

NEW YORK, March 26, 1890.

To the Honorable, The Commissioners of the Board of Electrical Control:

GENTLEMEN:—I have investigated the communications referred to me at the last meeting, namely, the applications for space in the conduits, of the East River Electric Light Company and the Harlem Lighting Company, and am informed by the officers of the Construction Company that all the space applied for by the above named Companies has been allotted to them.

Respectfully,

H. S. KEARNY, Engineer.

Samuel B. Clark, representing the Manhattan Electric Light Company and the Harlem Lighting Company, stated to the Board that the application for ducts on Third avenue was made on March 6th instant, and that thirty-one days would have been sufficient time to run the cables in.

Commissioner Moss: How much longer time do you want?

Mr. Clark: Give us until the 4th or 5th of May.

Commissioner Moss, after some further discussion, offered the following resolution:

Resolved, That the time of the Electric Light Companies owning or operating electric light conductors on Third avenue and adjacent streets to comply with the

Board's notice of ninety days expiring April 8th, 1890, be extended thirty days from that date.

Unanimously adopted.

Mr. Kenneson stated that he appeared before the Board at the request of ex-Commissioner Gibbens, whose father died last night, on behalf of the application of the Empire and Bay States Telegraph Company for permission to string ten wires on poles already erected from the Westchester line down to the Harlem River, there to connect with the cables of the Western Union Telegraph Company on the Elevated Railroad structure, and asked that the application be granted.

Expert Wheeler stated that the application had been in the office a long time, that he had considered it very carefully, and thought it ought to be granted.

The Board, however, after discussing it, upon the suggestion of Mr. Kenneson, and upon motion of Commissioner Hess, laid it over until the next meeting.

The following communication of the United States Illuminating Company was read:

NEW YORK, March 21st, 1890.

HON. THEODORE MOSS, Secretary, Board of Electrical Control, New York City, N. Y.

DEAR SIR:—We have communicated to the Commissioner of Public Works a statement of the difficulties arising out of the necessity of placing the wires on Broadway in the subways in such a manner as to comply with the resolutions of your Board heretofore passed, and to supply our customers. This communication you have informed me has been referred to your Board. Remarks of similar character will apply with equal force to Third avenue and the Bowery, and we earnestly request that your Board authorize and direct the building of distributing conduits in these streets on the sides now occupied by the trunk conduit. In so doing we also request, and we think this due to the electric light companies, that the notice heretofore issued to the companies to place their wires in the subways in the streets near to and occupied by the subways shall be extended sixty days until these additional distributing conduits be provided.

We request that this matter receive your immediate consideration, as the time allowed by the notice will shortly expire.

Very truly yours,

THE UNITED STATES ILLUMINATING COMPANY,

WM. H. BROWNE.

The Board heard statements in respect to the matter of the communication of the United States Illuminating Company, from Mr. Jackson and Mr. Cravath, representing the Company, Commissioner Gilroy, Engineer Kearny, Expert Wheeler and others, and discussed it at great length.

Mayor Grant, at its conclusion, offering the following resolution :

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized and directed to construct distributing conduits for electric light and power service, in Broadway, from Bowling Green to 14th street, and in 14th street, from Broadway to University place, on the sides of these streets not now occupied by the trunk conduits—number of ducts to be determined by the Engineer of the Board, and to be based upon the number applied for on or before March 27th instant by written application of the Electric Light and Power Companies—work of construction to commence on or before April 10th, and to be completed within sixty days from this date—and the time of the ninety days' notice as it affects these and the adjacent streets to be extended until the completion of the distributing conduits ordered by this resolution.

Unanimously adopted.

The following communication from the Standard Electrical Subway Company was read :

NEW YORK, March 21st, 1890.

COL. HENRY S. KEARNY, Engineer of the Board of Electrical Control :

DEAR SIR :—We have been making inquiries as to the possibilities of arranging for a sufficient supply of pipe to do all the subway work mapped out for the present year. As we have already indicated, we are willing to use that form of pipe which is most satisfactory to the Board of Electrical Control and the electric lighting companies. It seems doubtful, however, if we can count on securing enough iron pipe to meet the demands which will be made upon us during the present season, especially as a great amount of work will have to be begun during the next sixty days. Several of the companies are anxious that cement-lined pipe such as has already been used in the 23d Street Subway should be used, and this we find can be obtained more rapidly than iron pipe. We understand that it was upon your recommendation and approval that the cement-lined pipe was used in 23d street and elsewhere, and we therefore suggest that it will be to the interest of all concerned if the Board of Electrical Control would authorize us to build such subways as we shall be ordered to build, of either wrought iron pipe or cement-lined pipe.

We trust that you will bring this matter to the attention of the Board at the meeting to-morrow as it is of the utmost importance that we should be able to place our orders for pipe at once.

Yours very truly,

STANDARD ELECTRICAL SUBWAY COMPANY,

By GEORGE R. HARDY, Engineer.

Engineer Kearny: I simply submit that communication of the Standard Electrical Subway Company, because I was requested to bring it before the Board.

Commissioner Hess: We cannot take action on it now.

Commissioner Moss stated that the cement-lined conduit had been used in several of the city streets, and named them.

The Board discussed the matter of the communication, and

Mayor Grant offered the following resolution:

Resolved, That the communication of the Standard Electrical Subway Company, dated March 21st, 1890, be laid over.

Unanimously adopted.

The Board now took up the consideration of the following report of Engineer Kearny:

NEW YORK, March 22d, 1890.

To the Honorable, The Commissioners of the Board of Electrical Control:

GENTLEMEN:—The various high-tension Electric Light Companies doing business in New York City have recently made many written applications for space in subway to be built, as designated by colored lines on the accompanying map and in the original applications of United States Illuminating Company, Mount Morris Electric Light Company and East River Electric Light Company. All of which I submit for your consideration, and respectfully recommend that the work be authorized by this Board, and the subways constructed whenever the Commissioner of Public Works will permit the opening of streets specified.

The quantity of work designated I believe to be more than will be performed in one season, and as the Commissioner of Public Works has notified this Board that certain streets, which he designates, will be repaved this year—work to begin March 15th—it seems probable that a large part of the work applied for will be indefinitely postponed, unless some arrangements can be made with the Department of Public Works to delay the paving contemplated until subways have been constructed in these streets.

I recommend that work should be begun at once on the necessary distributing system for Electric Light Service on Broadway below 14th street and on Third avenue and Bowery, in each case to be on the opposite side of the street to the trunk line of subway constructed last season.

The Edison Electric Illuminating Company also make application, through the Consolidated Telegraph and Electrical Subway Company, for accommodation for its service in streets, as designated on an accompanying map and in original letter of March 17th from L. F. Beckwith, Chief Engineer, which I submit, and recommend that the work be authorized and the Consolidated Telegraph and Electrical Subway Company be ordered to proceed with it at once.

I have also to recommend that the Board authorize the construction of crossings for Electric Light Service, applied for, to connect with existing subway,

Broadway, at Canal street, Washington place and 45th street,
Third avenue, at 16th street;

and for Telephone and Telegraph service, a crossing of

Sixth avenue at 16th street.

The Western Union Telegraph Company alone desire a subway accommodation in 55th and 64th streets from the Elevated Railroad structure to the Hudson River, and, as I believe the work will be built much more quickly as a subsidiary connection than otherwise, I recommend that it be so authorized, and two more streets cleared of poles thereby.

The application of the North New York Lighting Company, for accommodation in the district north of Harlem River, is herewith submitted for your consideration. No subways have been built in that district, nor have the requirements of the neighborhood been ascertained; but, if the Board does not intend to give overhead accommodations in that district to Electric Lighting Companies, I would recommend that its application be considered favorably at once, so that the wires can be operated underground.

Respectfully,

H. S. KEARNY, Engineer.

The Board considered the report of Engineer Kearny, and heard statements in respect to it from Engineer Kearny and Commissioner Gilroy.

Commissioner Gilroy: I suggest that the Engineer of this Board, together with myself and the representatives of the Electric Light Companies and the Construction Companies, meet in my office to-morrow, at 11.30 o'clock A. M., and go over this matter and make a report to this Board.

Mayor Grant: Let this Board meet on Friday, March 28th, at 11 o'clock A. M., for the purpose of taking it up.

Mr. Leslie: I would like to call attention to the situation in which the Harlem Company is going to be placed by the construction of the distributing system on the opposite side of the street from where the main conduit is now built. We have got to go on and do an immense amount of work within the next thirty or forty days. Now, within that thirty days I imagine this distributing conduit will not be constructed on the opposite side of the street, but we will be obliged to put our service underground nevertheless.

The Board assured Mr. Leslie that the time would be extended until the completion of the distributing conduit.

Mayor Grant moved the following resolution:

Résolved, That the application of the Metropolitan Telephone and Telegraph Company, dated March 25, 1890, to transfer its wires on its line beginning at Third avenue and 106th street, thence running west on 106th street to Lexington avenue, and thence north to 120th street, to its Second avenue and Third avenue lines between 106th and 125th streets, and to convey them through 125th street to its Exchange at the corner of

Lexington avenue, be granted, upon condition, nevertheless, that it remove the line of poles from which the transfer is to be made as soon as it is completed.

Unanimously adopted.

Engineer Kearny, previous to the moving of the foregoing resolution, stated that he recommended the granting of the permission given by the resolution.

Mayor Grant also offered the following resolution :

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company before the Board for permission to string wires in districts where there are no subways, to make individual telephone connections, reported favorably upon by Expert Wheeler, be granted.

Unanimously adopted.

Expert Wheeler stated that he would like to have the amount of wire that can be used for making a lamp connection extended to 200 feet, if it is where the line is overhead and where there is no subway, and cut down to 100 feet where there is a subway.

Mayor Grant: I think you had better make a recommendation on Friday.

Mayor Grant offered the following resolution :

Resolved, That the Electrical Expert be empowered to re-appoint, for temporary duty for a period of thirty days, the three temporary inspectors of electrical conductors whose present appointment expires March 28th instant.

Unanimously adopted.

Mr. Clark stated to the Board, on behalf of the Manhattan Electric Lighting Company, that if the situation arises that Company stands ready to fulfill its offer to make a contract with the Board and to construct certain subways, made in a communication to the Board, dated February 27, 1890.

Mayor Grant offered the following resolution :

Resolved, That the application of the Brush Electric Illuminating Company, dated March 6th, 1890, to remove six poles belonging to the United States Illuminating Company, on the north side of 4th street, between Bowery and Second avenue, and four poles of the Fire Department on the south side of 4th street between Bowery and Second avenue, to reset four poles for Fire Department on north side of 4th street, and to transfer the electric light wires to its poles on the south side of the street and the Fire Department wires to the poles on the north side of the street—the Fire Department and United States Illuminating Company consenting to the arrangement—be granted.

Unanimously adopted.

Expert Wheeler stated to the Board, previous to the moving of the foregoing resolution by Mayor Grant, that he approved of the granting of the application of the Brush Company.

The Board, on motion of Commissioner Hess,

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Monday, March 31st, 1890, at 1 o'clock P. M.

Present: Mayor Hugh J. Grant, President; Commissioner Jacob Hess, Commissioner Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant suggested that the Board first take up the matter of the decision by the General Term of the Supreme Court in relation to the making of the contract with the Standard Electrical Subway Company, and asked Assistant Corporation Counsel Dean, who was present, if he had anything to say upon the subject.

Mr. Dean: In the Armstrong case the injunction stands, as I understand the opinion, not upon the ground of lack of power in the Board to make a new contract, but because the Court thought the provisions of the present contract were not sufficiently explicit in several points that are suggested by the opinion to meet their approbation; so that the new contract in its present shape cannot be made. But the order has not yet been settled; and until the order is settled I suppose we can scarcely define the effect of the decision.

Wheeler H. Peckham (of Counsel for the Standard Electrical Subway Company) stated to the Board that it seemed to him that nothing could be done until the order was settled and it was known what was decided.

Mayor Grant: When will it be decided?

Mr. Peckham: The question is when the General Term will hear anything upon the subject—settled in three or four days.

Mayor Grant: I, of course, would like to have this matter settled as speedily as possible, and if the order is not settled I can hardly see that there is anything for this Board to do but to adjourn.

Commissioner Gilroy stated that there was something for the Board to do in relation to the paving contracts. He made a statement respecting these contracts and suggestions concerning future subway construction, and called attention to the following communication addressed by him to the Board:

NEW YORK, March 29th, 1890.

HON. HUGH J. GRANT, Mayor, and Chairman Board of Electrical Control:

DEAR SIR:—In pursuance of a resolution of your Board, referring to the Commissioner of Public Works, and the Chief Engineer of the Board of Electrical Control, for consultation and arrangement of plan, the matter of the construction of electrical subways in such manner as to cause the least possible interference with the new pavements and delay in carrying out the desired improvements, a consultation was held at this office on the 27th inst., at which Mr. Kearny, Engineer of your Board, and representatives of the various electrical subway construction and electric light companies were present.

The result of the consultation and conference is that the companies operating electric wires in this City, particularly the United States Illuminating Company, claim the right of having subways in all the streets where repavements have been authorized, and the question is how the construction of these subways can be carried out so as not to interfere with the repavement of the streets, or cause the disruption of the new pavements after they are laid.

In this connection I beg to say that the various companies or corporations desiring to lay conduits under street pavements have been fully apprised of the intention of the City authorities to repave certain streets, and the desirability of having all underground structures placed before the new pavements are laid, by notices issued to them from this Department under date of February 19th ultimo, giving a list of the streets to be repaved; consequently the matter under consideration is not new to them, and they have had ample time to prepare and carry out their plans for subway constructions. The companies and corporations were notified at the same time that if they did not complete their constructions under the streets before the laying of the new pavements, no permit would be issued to them to open the new pavements for their purposes.

The efforts of this Department to secure the construction and completion of electrical subways in advance of the laying of the new pavements have been of little or no avail, and, in respect to the repavements of streets to be made this year, nearly all of which are already under contract, this Department stands in the position of ordering the work to be proceeded with subject to any injury that may be done to it by subsequent disruption of the pavements for the construction of subways, or withholding the contractors from proceeding with their work for an indefinite time until the different companies find it convenient to construct and complete their subways.

On behalf of the interests intrusted to this Department in respect to the maintenance of public streets, I must disclaim any responsibility for the condition of the streets if new pavements, designed for the benefit of the public, are to be torn up and injured for the benefit and convenience of private corporations, and I must also present the fact that, in all cases where contracts for new pavements have been made, the City is under obligations to the contractors, which do not admit of any indefinite postponement of their work, or any arbitrary definition of the time when their work shall be done to suit the action or desire of the private corporations who wish to build subway constructions.

In view of all these facts, I would ask the Board of Electrical Control to compel the companies having privileges to build electrical subways to submit at once their plans for the construction of such subways, and to proceed with said work so as to complete it within a period which will enable this Department to proceed with and complete the repavement of the streets within the season of 1890, such period to be limited to sixty days.

If these subway constructions are not completed within that time, or if action is not taken without delay to secure such completion, it will become my duty to proceed with the repavement of the streets, irrespective of any possible disruption of the same, and to refuse all permits for opening the new pavements, unless compelled by order of the courts.

I inclose herewith a list of the streets now under contract for new pavements, and of the streets for which contracts for new pavements are about to be made.

Very respectfully,

THOMAS F. GILROY,

Commissioner of Public Works.

The following is the "list of the streets" referred to in the foregoing communication of the Commissioner of Public Works:

March 25th, 1890.

REPAVEMENTS ON UPTOWN STREETS NOW UNDER CONTRACT.

Madison avenue, 94th to 103d street.
Tenth avenue, 140th to 151st street.
67th street, Ninth avenue to Boulevard.
88th street, West End avenue to Riverside Drive.
101st street, Ninth to Tenth avenue.
135th street, Madison avenue to Harlem River.
141st street, Tenth avenue to Boulevard.
96th street, Eighth to Ninth avenue.
96th street, Ninth to Tenth avenue.
74th street, Eighth to Ninth avenue.
65th street, Tenth avenue to Boulevard.
66th street, Eighth to Ninth avenue.
70th street, Eighth to Ninth avenue.
77th street, Boulevard to Riverside Drive.
Avenue B, 79th to 86th street.
88th street, Park to Madison avenue.
92d street, Boulevard to West End avenue.
100th street, Boulevard to Riverside Drive.
102d street, Ninth to Tenth avenue.
108th street, Boulevard to Riverside Drive.
114th street, Eighth to Manhattan avenue.
119th street, Eighth to Manhattan avenue.
119th street, Ninth to Manhattan avenue.
126th street, Ninth to St. Nicholas avenue.
134th street, Fifth to Lenox avenue.
136th street, Seventh to Eighth avenue.
143d street, Seventh to Eighth avenue.
144th street, Eighth avenue to First New avenue, West.
146th street, St. Nicholas to Tenth avenue.

REPAVEMENTS NOW UNDER CONTRACT.

Whitehall street, Beaver street to South Ferry.
Madison avenue, 33d to 36th street.
Madison avenue, 41st to 42d street.
Madison avenue, 42d to 58th street.
58th street, Madison to Fifth avenue.
Wall street, Broadway to Pearl street.
Thomas street, Church to Hudson street.
Howard street, Broadway to Mercer street.
Greenwich avenue, Eighth avenue to West 13th street.
Horatio street, Greenwich avenue to West 14th street.
Cliff street, Ferry street to John street.
Platt street, Pearl to William street.
Stone street, William to Broad street.
Bridge street, Broad to State street.
Lexington avenue, 34th to 35th street.
Lexington avenue, 59th to 66th street.
Lexington avenue, 69th to 97th street.
13th street, Avenue B to Fifth avenue.
Broad street, Exchange place to Pearl street.
Reade street, Elm to Washington street.
Leonard street, Broadway to Hudson street.
Laight street, Canal to Greenwich street.
Boulevard, 59th to 79th street.
43d street, Madison to Fifth avenue.
60th street, Fourth to Fifth avenue.
67th street, Fourth to Fifth avenue.
68th street, Fourth to Fifth avenue.
Lexington avenue, 21st to 32d street.
Lexington avenue, 42d to 59th street.
Lexington avenue, 66th to 69th street.
46th street, Madison to Sixth avenue.
47th street, Madison to Sixth avenue.
25th street, Broadway to Sixth avenue.
32d street, Madison to Fifth avenue.
40th street, Fourth to Fifth avenue.
Broome street, Centre street to Broadway.
Bleecker street, Bowery to Crosby street.
Varick street, Franklin to Canal street.
Spring street, Bowery to Broadway.
Broad street, Wall street to Exchange place.
38th street, Fourth to Madison avenue.

REPAVEMENTS AUTHORIZED, BUT NOT YET CONTRACTED FOR.

Elizabeth street, Bleecker to Bayard street.
South William street, William to Broad street.
William street, Wall to Frankfort street.
Pearl street, Fulton to Oak street.
New Bowery, Oak street to Chatham Square.
East Broadway, Chatham Square to Grand street.

Park row, Frankfort street to and including Chatham Square.
Harrison street, Hudson to Washington street.
Desbrosses street, Hudson to Greenwich street.
Catharine street, Division to Cherry street.
Washington street, Spring to Clarkson street.
Leroy street, Washington to West street.
Houston street, Washington to West street.
Little West 12th street, Washington street to Tenth avenue.
Bank street, Washington to West street.
Broadway, Bowling Green to 32d street.
Canal street, Hudson street to Bowery.
Greenwich street, Chambers to Canal street.
33d street, Madison avenue to Broadway.
36th street, Fourth to Sixth avenue.
37th street, Fourth to Sixth avenue.
38th street, Fifth to Sixth avenue.
49th street, Madison to Sixth avenue.
50th street, Fourth to Fifth avenue.
51st street, Madison to Sixth avenue.
53d street, Madison to Sixth avenue.
54th street, Madison to Sixth avenue.
68th street, Third to Fourth avenue.
69th street, Lexington to Fifth avenue.
Eighth avenue, 13th to 59th street.
Hanover street, Pearl street to Exchange place.
Exchange place, Hanover to William street.
William street, Beaver to Wall street.
58th street, Fifth to Sixth avenue.
60th street, Lexington to Fourth avenue.

Commissioner Gilroy: I wish something should be done to relieve me from the position I occupy. The citizens expect from the appropriations made the streets will be paved and they will get some benefits for their money. I was going to suggest that in those streets where the work is absolutely ordered to be done under contract the Consolidated Telegraph and Electrical Subway Company should be authorized and directed to go on and build subways.

The Board discussed the communication of Commissioner Gilroy at great length. It also considered a suggestion that the Consolidated Telegraph and Electrical Subway Company be directed to construct for the Edison Electric Illuminating Company subways in the streets designated by Commissioner Gilroy as now under contract to be repaved, and at the same time to lay conduits for the other electric light companies, and listened to statements and arguments in respect to the proposition from representatives of the several companies, and from representatives of the Consolidated Company and the Standard Company.

Mayor Grant closed the discussion by the following statement and direction:

"On Thursday, April 3, 1890, at 11 o'clock A. M., we shall hold a meeting, and shall direct that either the Consolidated Telegraph and Electric Subway Company, or the Standard Electric Subway Company proceed to open such streets as Commissioner Gilroy may designate, that subways for the Edison Electric Illuminating Company be laid at the same time, and that there be a limit to the time in which the work shall be done."

Mayor Grant: Colonel Kearny wishes me to say that the hearing on the matter of rentals will be held at his office on Wednesday, April 2d, 1890, at 12 o'clock.

Ex-Commissioner Gibbens appeared before the Board, and argued in behalf of the application of the Empire and Bay State Telegraph Company to string wires, laid over at the last meeting:

Commissioner Moss moved the following resolution:

Resolved, That the application of the Empire and Bay State Telegraph Company, dated March 8th, 1890, to string ten wires on poles already erected by permission of this Board from the Westchester line to the Harlem River, be granted.

Unanimously adopted.

The following recommendation of Expert Wheeler was read:

NEW YORK, March 27th, 1890.

To the Honorable, the Commissioners of the Board of Electrical Control:

GENTLEMEN:—I have to recommend that rule No. 32 be amended to read as follows:

"32. The Secretary is authorized to issue to companies operating electrical conductors all permits required by them for the making of connections not exceeding 225 feet of wire, necessary to the business of said companies, with overhead lines now in use, and which the Mayor has not been requested to remove, upon the certification of the Expert that there has not been a subway in the street in question for more than ninety days for this class of conductors. The Secretary is authorized to issue similar permits for connections to cables in subways not requiring more than 100 feet of overhead wire. Said connections to be in every case in accordance with the Rules and Regulations of the Board."

And that the rules be made to read: "Unanimously adopted, March 31st, 1890, to take effect immediately, superseding all other rules."

Very respectfully,

SCHUYLER S. WHEELER, Electrical Expert.

Expert Wheeler explained the necessity for the proposed amendment to Rule No. 32.

The Board discussed the matter, and

Mayor Grant offered the following resolution:

Resolved, That Rule No. 32 of the Rules and Regulations for Overhead Wires be amended so as to read as follows:

"32. The Secretary is authorized to issue to companies operating electrical conductors all permits required by them for the making of connections not exceeding 225 feet of wire, necessary to the business of said Companies, with overhead lines now in use, and which the Mayor has not been requested to remove, upon the certification of the Expert that there has not been a subway in the street in question for more than ninety days for this class of conductors. The Secretary is authorized to issue similar permits for connections to cables in subways not requiring more than 100 feet of overhead wire. Said connections to be in every case in accordance with the Rules and Regulations of the Board."

And that the caption, "Unanimously adopted February 19th, 1890, to take effect immediately, superseding all other rules," at the head of such Rules and Regulations for Overhead Wires, be amended to read as follows:

"Unanimously adopted, March 31st, 1890, to take effect immediately, superseding all other Rules."

Unanimously adopted.

Mr. Leslie (of the Harlem Lighting Company) asked the Board to take up the consideration of the question of ordering a distributing conduit on Third avenue, stating that it was just as necessary as the one ordered at the last meeting to be constructed on Broadway.

Judge Kelly (of the East River Electric Light Company) asked the Board to order the construction of distributing conduits in the Bowery and Park row as well.

Commissioner Hess: On Thursday, no matter what the decision of the court may be, we are going to direct a distributing duct to be built on Third avenue, the Bowery and Park row.

Engineer Kearny: I call your attention to the fact that I have written, as Engineer of the Board, to every electric light company asking it to state where it wants accommodations, and Mr. Leslie's Company is the only one that has not signified its wishes about accommodations in the subways.

Mr. Cohen (of counsel for the Consolidated Company) asked that the Board take no action in the matter until the meeting on Thursday.

Mayor Grant: How many ducts do you want?

Mr. Leslie: Of course, we must have one distributing duct on the opposite side of the street.

Commissioner Moss: How many more do you want?

Engineer Kearny: Why don't you say how many you want?

Mr. Leslie: I am willing to say now—I want one distributing duct.

Mr. Ridgway (Vice-President Consolidated Company): Why would it not be well for the Board to insist that the electric light companies state definitely what ducts they require for their business.

Mr. Browne (of the United States Company): I want to confirm our application in regard to that by the statement that as soon as you are ready for us the three distributing ducts applied for will be occupied.

Mayor Grant, at the conclusion of the discussion, offered the following resolution:

Resolved, That this Board, at the meeting to be held on Thursday next, authorize and direct either the Standard Electrical Subway Company or the Consolidated Telegraph and Electrical Subway Company to build distributing ducts on Third avenue, the Bowery and Park row on the sides of those streets opposite to the trunk lines already constructed there, and that the companies be directed to order their material immediately.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Tuesday, April 8th, 1890, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Commissioner Hess offered the following resolution:

Resolved, That the minutes of the meeting of March 26, 1890, be amended as follows: That the word "four" be substituted for the word "three" in the resolution empowering the Electrical Expert to reappoint inspectors of electrical conductors for temporary duty.

Unanimously adopted.

The following communication was brought up and discussed:

NEW YORK, April 7th, 1890.

THEODORE MOSS, Secretary, Board of Electrical Control, 1266 Broadway, City:

DEAR SIR:—The U. S. Illuminating Company have laid in the subways from their Washington street station to Fulton street, and on Fulton street to Broadway, a number of large duplex cables manufactured by the Standard Underground Cable Company, of Pittsburg. These subways are heated from the steam pipes in this district, and the cables in them have an insulation resistance per conductor from Washington street station to Broadway and Fulton street (a distance of about 1,700 feet) of six megohms. When tested by the manufacturers at the temperature of about 70 degrees Fahrenheit, they had an insulation resistance per mile of conductor of about 2,250 megohms, which is equivalent to about 7,000 megohms for 1,700 feet of conductor.

The rules of the Board of Electrical Control require that cables for the uses for which these cables are intended shall have an initial insulation resistance at a temperature of 75 degrees Fahrenheit of 150 megohms per mile of conductor, which would be about 472 megohms per 1,700 feet, and the insulation as measured above shall not fall below one-third of this value, or about 157 megohms for 1,700 feet.

Experiments made upon the cables by the manufacturers showed that if the temperature of the cables was raised to 154 degrees Fahrenheit, the insulation resistance would fall from 7,000 megohms to six megohms per 1,700 feet of conductor.

Assuming that the average temperature of the subway between the Washington street station and Fulton street and Broadway was 154 degrees Fahrenheit, as above stated, the calculated resistance of the cables would be six megohms, as was obtained by actual test of the cables when laid in this district.

It has been stated that the temperature of the subways at points in this district rises to 175 to 200 degrees Fahrenheit, and it becomes evident from this that the loss of insulation of the cables from its original value is not due to bad workmanship in laying or jointing the cables, since, if the workmanship was bad, this, combined with the heat effect, would necessarily cause the insulation of the cables to fall below the six megohms obtained.

The U. S. Illuminating Company have had connected up for about two weeks, ready to operate, a large feeder, which they need to use at once for the purpose of supplying current for about 1,500 or 2,000 incandescent lights at 1,000 volts pressure.

The insulation tests of this cable have been reported to Mr. Maver, of the Consolidated Telegraph and Electrical Subway Company, and by him to Mr. Wheeler, of the Board of Electrical Control.

They have expressed the opinion that if they felt empowered to amend the rules of your Board, they would permit us to operate these cables, but as they believe that there is no rule directly applicable to this condition of cables, they

prefer not to authorize their use until the Board passes upon the question, and we desire that we be allowed to proceed to put them into use.

Very respectfully,

THE UNITED STATES ILLUMINATING COMPANY,

By FREDERICK DARLINGTON, Electrician.

The Board considered the communication of the United States Illuminating Company, hearing statements from Expert Wheeler, Engineer Kearny, Mr. Browne and Mr. Cravath, of the United States Company, and Mr. Ridgway, of the Consolidated Telegraph and Electrical Subway Company, in relation to its subject matter,

Mayor Grant offering the following resolution:

Resolved, That the matter of the communication of the United States Illuminating Company, dated April 7, 1890, be referred to the Electrical Expert, to make a report, with such additional testimony from other electrical experts as he thinks wise, to present to this Board.

Unanimously adopted.

Resolved, That the Engineer of the Board be directed to notify the Steam Heating Company that in certain localities, which he shall specify, there is steam escaping to such an extent that it makes the temperature in the subways very high, and to ask that Company to make repairs at these places.

Unanimously adopted.

Mayor Grant: Now, about the future subways—is there any one present representing the Standard Electrical Subway Company?

Gentleman: I want to say Mr. Peckham is unable to be here on account of a misunderstanding as regards the time of this meeting, and he is at Albany.

Mayor Grant: It amounts to this—you don't propose to keep that arrangement.

Gentleman: I am not prepared to discuss the legal aspect of this question.

Mayor Grant: Is your Company prepared now, or is there anybody representing your Company prepared now, to execute that contract that was made, with the amendments as specified by the General Term?

Gentleman: That matter is entirely in Mr. Peckham's hands.

Mayor Grant: Is there anybody here willing to execute that contract now?

Gentleman: Mr. Peckham is not here.

Mayor Grant: The Board has acted in good faith, hoping it would succeed in getting the contract executed, and getting the work done this summer.

Commissioner Hess: It leaves us in a quandary as to the condition of this work.

Mr. Lauterbach: I was under the impression until a day or two ago that the modification of the contract suggested by the Corporation Counsel would be accepted by the Standard Electrical Subway Company. The intimation was made to me, however, in about that time, that it would not be conformed to. I am surprised Mr. Peckham is not here to have made the statement himself, though I think I am not going outside of the record in saying that the Standard Electrical Subway Company has determined not to go on with it. That is the case, though I had assumed that branch of the work they assumed to do would be done by them, and it leaves the Consolidated Telegraph and Electrical Subway Company under its contract and to respect the mandates of the Board.

Commissioner Hess offered the following resolution:

Resolved, That the resolution, adopted at a meeting of the Board held February 17, 1890, directing the Standard Electrical Subway Company to construct subways within the current year in certain named streets, be repealed.

Unanimously adopted.

Mayor Grant: Now, there is nothing for this Board to do except to get the Consolidated Telegraph and Electrical Subway Company to do the very best we can, in the construction of subways in such streets as Mr. Gilroy is going to repave, at first.

Commissioner Gilroy stated that he had repaved portions of Lexington and Madison avenues, and requested the Board to exclude from any order it might make any street or portion of a street which had been repaved.

Mayor Grant offered the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized and directed to proceed forthwith to construct subways for electric light and power service, for both the Edison Electric Illuminating Company and the other Electric Light Companies, in streets under contract by the Department of Public Works or authorized by the Board of Estimate and Apportionment to be repaved, as designated by the Engineer of this Board, except such streets and portions of streets as may have already been completed under the contracts.

Unanimously adopted.

Ex-Commissioner Gibbens: On behalf of the Manhattan Company I desire to ask that we be allowed to put in application for such ducts as we may desire on

all these streets which are to be torn up to lay general subways and subways for the Edison Company.

Mayor Grant moved the following resolution:

Resolved, That the Electric Light and Power Companies be directed to furnish, on or before Thursday next, to the Engineer of this Board the number of ducts that they actually require and will occupy in the subways already ordered under a previous resolution, or others, if any, to be ordered, and, in default thereof, that the Engineer be directed to proceed with the work according to his best judgment.

Unanimously adopted.

The Board discussed the question of requiring the Electric Light and Power Companies applying for accommodation in subways to give a guarantee that the space applied for is actually required, representatives of the United States, Brush, Manhattan, Harlem and East River Companies stating their willingness to make it, and

Mayor Grant offered the following resolution:

Resolved, That Electric Light and Power Companies making application for space in subways hereafter to be constructed, accompany it with a bond satisfactory to the Engineer of the Board, to the effect that the ducts applied for are actually required and will be occupied.

Unanimously adopted.

Ex-Commissioner Gibbens: May I ask, Mr. Chairman, that the Engineer will furnish my Company with a list of those streets just as soon as possible after the meeting?

Engineer Kearny: I am informed that Mr. Gilroy has furnished the list to every Company.

Mayor Grant offered the following resolutions:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be directed, immediately upon the completion of the subways ordered in streets under contract or authorized to be repaved, or at such times as it finds it will not interfere with other work, to construct and complete as soon as possible subways for both the Edison Electric Illuminating Company and the other Electric Light and Power Companies, upon the application of such other Companies and their accompanying bond, in the following streets and avenues:

Broadway, west side, Battery place to Thames street.

Broadway, east side, Marketfield street to Exchange place.

Broadway, west side, Dey to Grand streets.
Broadway, east side, Chambers to Grand streets.
Bowling Green, south side, State to Whitehall streets.
Broad street, both sides, Exchange place to Beaver street.
Beaver street, both sides, Pearl street to Broadway.
West street, east side, Liberty to Vesey streets.
Liberty street, both sides, Broadway to West street.
Cortlandt street, both sides, Broadway to West street.
Dey street, both sides, Broadway to West street.
Fulton street, both sides, Broadway to West street.
Vesey street, both sides, Broadway to West street.
West Broadway, east side, Chambers to Canal streets.
Greenwich street, east side, Vesey to Chambers streets.
Barclay street, both sides, Broadway to Greenwich street.
Park place, both sides, Broadway to Greenwich street.
Murray street, both sides, Broadway to Greenwich street.
Warren street, both sides, Broadway to Greenwich street.
Chambers street, both sides, Centre to Greenwich streets.
Reade street, both sides, Centre street to West Broadway.
Duane street, both sides, Broadway to West Broadway.
Thomas street, both sides, Broadway to West Broadway.
Worth street, both sides, Broadway to West Broadway.
Leonard street, both sides, Broadway to West Broadway.
Franklin street, both sides, Broadway to West Broadway.
White street, both sides, Broadway to West Broadway.
Walker street, both sides, Broadway to West Broadway.
Park row, east side, Spruce to Centre streets.
Centre street, west side, Park row to Reade street.
Canal street, both sides, Broadway to West Broadway.
Eighth avenue, both sides, 14th to 45th streets.
Seventh avenue, west side, Broadway to 53d street.
Broadway, west side, 40th to 49th streets.
Sixth avenue, both sides, 40th to 51st streets.
Fourth avenue, both sides, 14th to 32d streets.
Third avenue, both sides, 14th to 46th streets.
14th street, both sides, Sixth to Eighth avenues.
14th street, north side, Third to Fourth avenues.
23d street, south side, Third to Fourth avenues.
23d street, both sides, Sixth to Eighth avenues.
26th street, both sides, Third to Eighth avenues.
36th street, north side, Third to Fourth avenues.
39th street, both sides, Sixth to Eighth avenues.

40th street, both sides, Third avenue to Broadway.
42d street, both sides, Broadway to Eighth avenue.
44th street, north side, Sixth to Eighth avenues.
45th street, north side, Fifth to Sixth avenues.
46th street, both sides, Fifth to Eighth avenues.
47th street, south side, Madison to Eighth avenues.
48th street, south side, Fifth to Seventh avenues.
49th street, north side, Madison to Eighth avenues.
50th street, south side, Fifth to Sixth avenues.
51st street, both sides, Fifth to Sixth avenues.
52d street, north side, Fifth to Sixth avenues.
55th street, north side, Fourth to Sixth avenues.
56th street, both sides, Fourth to Sixth avenues.
57th street, south side, Madison to Fourth avenues.
58th street, south side, Madison to Seventh avenues.
59th street, south side, Madison to Sixth avenues.

Unanimously adopted.

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized and directed to construct distributing ducts on Third avenue, the Bowery and Park row, on the sides of those streets opposite to the trunk lines of subways already built there.

Unanimously adopted.

Resolved, That permits issue to the Metropolitan Telephone and Telegraph Company to string wires for individual telephone connections, upon its applications before the Board for such connections in localities where there are no subways, approved by the Electrical Expert.

Unanimously adopted.

Adjourned sine die.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, April 23d, 1890, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant offered the following resolution:

Resolved, That the Secretary be authorized to issue a permit, subject to the approval of the Electrical Expert, to the C. & C. Motor Company to run a wire carrying a current of 220 volts from the top of its building on Greenwich street, over housetops, across Hubert street, to the top of the Hillis Building on Washington street.

Unanimously adopted.

Expert Wheeler read to the Board the following report:

NEW YORK, April 22d, 1890.

To the Honorable, The Commissioners of the Board of Electrical Control:

GENTLEMEN:—In reference to the matter of electric light cables in the subways in lower Broadway which are subjected to high temperatures, I have to report as follows:

It does not seem practicable to make a cable, the insulation of which will not be lowered by this increased temperature, inasmuch as all of the best flexible insulating substances vary in resistance inversely with rise in temperature.

Again, the question of reducing the heat in the subways has been under consideration for a considerable length of time, and it does not seem likely that the objectionable heating will be overcome for some time.

The question is thus limited to that of permitting electric lighting to be carried on with cables whose insulation is reduced by moderate heat; and, in this connection, the only question that need be considered by the City is that of safety. Though the insulation of the cables in other subways is maintained at a standard far above that which is possible in the heated districts, their total insulation, including wires and buildings which are connected to them, is much less than that which is obtained with the heated cables; and therefore it seems reasonable to permit the use of these cables guarded by special and frequent tests, inasmuch as their insulation is even now better than it ordinarily would be when the house wiring is connected in the usual way, as practised with the 300 miles of cables in use in the subways in the City.

I have, as authorized by your resolution, obtained the written opinions of several electricians upon this question, and they all confirm the opinion expressed herein. The letters are from Mr. Frank Darlington, Electrician of United States Illuminating Company, Mr. E. G. Acheson, Consulting Electrician of the Standard Underground Cable

Company; H. W. Fisher, Electrician of the Standard Underground Cable Company, and Dr. Henry Morton, President of the Stevens Institute. They are attached hereto and form a part of this report.

Very respectfully.

S. S. WHEELER, Electrical Expert.

Expert Wheeler stated that the meeting had been called to hear this report, the United States Illuminating Company having some cables in subways it cannot bring up to the test because they are too hot. He further stated, in reply to questions put by Mayor Grant, that the letters appended to and forming part of his report had come to him through the United States Company, and not upon his personal solicitation.

On motion of Mayor Grant, the matter of Expert Wheeler's report was referred back to him, for report as contemplated by resolution of April 8th.

The following communication of the Western Union Telegraph Company was read:

NEW YORK, April 16, 1890.

S. S. WHEELER, Electrical Expert, Board of Electrical Control, 1266 Broadway, N. Y.:

DEAR SIR:—The ninety days' notice contemplated by the resolution of the Board of January 8, having expired, I presume it is your intention to commence the removing of the lines at an early date.

Owing to our failure to secure "permit" to replace the 19-conductor lead cable with the 12-conductor Kerite cable on existing poles from Third avenue through 130th street to Fourth avenue, we have not yet been able to release the Fourth avenue line. Cannot some step be taken to hurry this "permit," in order that we may not be inconvenienced by the cutting this line before we are ready for it?

Owing to the great amount of rainy weather, we have not been able to complete our underground connections to the Broadway offices, and I have therefore to request that the taking down of the following lines be delayed until such connections are completed, which will be early in the coming month, viz.:

57th street, from Ninth avenue to Eighth avenue,
Fourth avenue, from 8th street to 10th street,
Mercer street,
Church street and Elm street.

The following lines have been released and can be taken down without any detriment to our service:

Houston street, Chrystie to First avenue,
Seventh avenue, 59th street to 11th street,
46th street, Eighth avenue to First avenue,
Amity street, Sixth avenue to South Fifth avenue,
Bleecker street, Downing to Mulberry,
Prince street, Macdougall to Bowery,
Baxter street, Worth to Grand,
Cliff street, Frankfort to John,

Water street, Old Slip to Dover,
Fulton street, Greenwich to Front.

Very respectfully,

W. C. HUMSTONE, Superintendent.

Mayor Grant moved the following resolutions:

Resolved, That the communication of the Western Union Telegraph Company, dated April 16th, 1890, be referred to the Engineer, to report, in writing, at as early a day as practicable.

Unanimously adopted.

Resolved, That the application of the Western Union Telegraph Company, dated March 21st., 1890, to place a 12-conductor cable on present poles, from 130th street and Third avenue, via 130th street and Fourth avenue, to 135th street and Fourth avenue, to take the place of cable now on the poles between the same points, which are to be taken down, be granted.

Unanimously adopted.

The following communication was read:

NEW YORK, April 22, 1890.

HON. HUGH J. GRANT, Mayor, President; HON. THEODORE MOSS, HON. JACOB HESS, Commissioners, Board of Electrical Control:

GENTLEMEN:—The North New York Lighting Company respectfully asks permission to build a distributing three-duct subway on North Third avenue, from 139th street to Grove street, on the west side, plans and location to be approved by the Engineer of the Board, and we will enter into a contract for same with the City in accordance with the law.

Very respectfully,

THE NORTH NEW YORK LIGHTING CO.,

By JOHN J. MOORE, Treasurer.

Mayor Grant offered the following resolution:

Resolved, That the application of the North New York Lighting Company, dated April 22, 1890, for permission to build a distributing subway on North Third avenue, be referred to the Engineer of the Board.

Unanimously adopted.

Resolved, That all applications of the Metropolitan Telephone and Telegraph Company to string wires for individual telephone connections now before the Board, and approved by the Expert, be granted.

Unanimously adopted.

Adjourned sine die.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, May 14th, 1890, at 3 o'clock P. M.

Present: Mayor Hugh J. Grant, Commissioner Jacob Hess, Commissioner Theodore Moss.

The minutes of the last meeting were read and approved.

The following report of Dr. Wheeler was read:

NEW YORK, May 14th, 1890.

To the Honorable, The Commissioners of the Board of Electrical Control:

GENTLEMEN:—In reference to the cables affected by steam heat, I have to report that I have carefully examined the subways in Fulton street where the trouble exists, and find, both from tests of the cables and examinations of the ducts with thermometers, that the low insulation is at two points—Fulton and Greenwich and Fulton and Broadway. The Steam Heating Company is at work at both these points and promises to make all necessary repairs as speedily as possible.

Very respectfully,

S. S. WHEELER, Electrical Expert to the Board.

The Board discussed the subject matter of the report of Dr. Wheeler, and heard a statement in respect thereto from Mr. Browne of the United States Illuminating Company. Mayor Grant called the attention of the Board and of Mr. Browne to the fact that a gentleman then present, whom he pointed out, had stated to him immediately previous to the meeting that he would furnish and guarantee to the United States Illuminating Company for use in the subways in question a cable that would meet the requirements of the rules, and suggested that the company confer with that gentleman. Mr. Browne accepted the suggestion, and expressed the willingness of his Company to order such a cable at once, but desired permission, pending the testing of such cable, to replace the wires with which it is now serving its customers with wires of larger size. The Board, however, took no action in respect to this request, and deferred further action in the matter.

The following other report of Dr. Wheeler was read:

NEW YORK, May 14th, 1890.

To the Honorable, The Commissioners of the Board of Electrical Control:

GENTLEMEN:—The following is a report of overhead lines which can be removed owing to the completion of subways and the giving of ninety days' notice, up to the present time.

The classes of wires, the lines which cannot be removed in consequence of Fire wires, the streets in which subways have just been completed, including the ninety days' notice, and streets where subways have been previously recorded are given in separate lists.

"List F." Streets where there are subways for telegraph and telephone lines which have been completed and recorded before.

"List B." Streets where there are subways for electric light lines which have been completed and recorded before.

"List E." Streets where subways for telegraph and telephone lines have recently been completed and ninety days' notice given.

"List A." Streets where subways have recently been completed for electric light lines and ninety days' notice given.

"List C." Streets where there are electric light lines which can be removed in consequence of the recent completion of subways.

"List D." Streets which have been cleared of electric light lines in consequence of the recent completion of subways.

"List K." Streets which have recently been cleared of telegraph and telephone wires in consequence of the recent completion of subways.

"List G." Streets which can be cleared of wires as soon as the Fire wires are removed.

"List J." Streets where telegraph and telephone lines can be removed at once.

"List H." Streets where the Western Union Telegraph Company have lines and which they will remove themselves, according to their agreement. (See accompanying letter.)

"List L." Streets where the Telephone Company have lines which they will remove themselves, according to agreement. (See accompanying letter.)

"List M." Streets which can be cleared of electric light wires as soon as the heat in the subways is overcome.

"List O." Streets which can be cleared of electric light wires as soon as the sixty days' extension of time granted by the Board has expired.

As will be seen, the foregoing shows that these lines enumerated in sheets "C" and "J" can be removed now, and that a very large number of lines can be removed as soon as the Fire wires (List G) are disposed of.

Very respectfully,

SCHUYLER S. WHEELER, Electrical Expert to the Board.

F.

See pages 8 and 9, Second Report of Board of Electrical Control.

B.

See pages 8 and 9, Second Report of Board of Electrical Control.

E.

See pages 230 and 231, Third Report of Board of Electrical Control.

Also the following streets adjacent to streets provided with trunk line subways:

57th street, Third to Tenth avenue,
Seventh avenue, 59th to 11th streets,
Fourth avenue, 79th street to Clinton place,
46th street, First to Eighth avenues,
41st street, Broadway to Sixth avenue,
39th street, Eighth to Lexington avenues,
19th street, First to Seventh avenues,

Amity street, Sixth avenue to South Fifth avenue,
Bleecker street, Downing to Greene streets,
Prince street, Macdougall street to Bowery.
Hester street, Centre to Chrystie streets,
1st street, First to Fourth avenues,
Mercer street, Clinton place to Canal street,
Wooster street, West 4th to Canal streets,
Elm street, Reade to Grand streets,
Baxter street, Worth to Grand streets,
Warren street, West street to College place,
Cliff street, Frankfort to John streets,
Fulton street, Greenwich to Front streets,
Liberty street, West to Gold streets,
Crosby street, Bleecker to Howard streets,
Water street, Old Slip to Dover street,
Church street, Canal to Barclay streets.

A.

See pages 230 and 231, Third Report of Board of Electrical Control.

Also the following streets adjacent to streets provided with trunk line subways:

13th street, First to Sixth avenues,
27th street, First to Third avenues,
Second avenue, 104th to 125th streets,
Fourth avenue, 14th to 32d streets,
43d street, Sixth to Vanderbilt avenues,
55th street, Eighth to Third avenues,
Chrystie street, Houston to Division streets.

C.

Streets where there are electric light lines which can be removed in consequence of the recent completion of subways:

23d street, Fourth avenue to Broadway, Brush,
23d street, Sixth to Eleventh avenues, Brush,
29th street, Third to First avenues, U. S. Co.,
42d street, Broadway to First avenue, Brush, City,
59th street, First to Eighth avenues, Brush, City,
Seventh avenue, 46th to 59th streets,
Houston Street, First avenue to Hancock street, E. R., U. S., Brush.

D.

Streets where electric light lines have been removed:

125th street, First to Eighth avenues,
27th street, Broadway to Madison avenue,
30th street, Broadway to Third avenue,
Eighth avenue, 42d to 59th streets,
27th street, First to Third avenues,
Second avenue, 104th to 125th streets,
55th street, Seventh to Third avenues.

K.

Streets clear of telegraph and telephone wires and poles :

Broad street, Exchange place to Wall street,
 John street, Nassau street to Broadway,
 Dey street, Broadway to Greenwich street,
 Barclay street, College place to West street,
 41st street, Broadway to Sixth avenue,
 Warren street, West street to College place,
 57th street, Eighth to Third avenues,
 58th street, Eighth to Ninth avenues,
 Liberty street, West to Nassau streets,
 19th street, Second to Seventh avenues,
 Amity street, Macdougall street to South Fifth avenue.

G.

Streets where wires can be removed as soon as the Fire wires are disposed of :

Centre street, Reade to Grand streets.
 Cedar street, Church street to North River,
 Murray street, College place to Broadway,
 Houston street, Chrystie street to First avenue,
 38th street, Lexington to First avenues,
 58th street, Ninth to Tenth avenues,
 Tenth avenue, 58th to 59th streets,
 Lexington avenue, 65th to 79th streets,
 79th street, First to Fourth avenues,
 57th street, Eighth to Tenth avenues,
 Fourth avenue, 79th street to Clinton place,
 46th street, Second to First avenues,
 19th street, First to Second avenues,
 Amity street, Sixth avenue to Macdougall street,
 Bleecker street, Downing to Greene streets,
 Prince street, Macdougall street to Bowery,
 Hester street, Centre to Chrystie streets,
 Mercer street, Clinton to Canal streets,
 Wooster street, West 4th to Canal streets,
 Church street, Canal to Barclay streets,
 Elm street, Reade to Leonard streets,
 Baxter street, Worth to Grand streets,
 Cliff street, Frankfort to John streets,
 Crosby street, Prince to Bleecker streets.

J.

Streets where telegraph and telephone lines can be removed at once :

Water street, Old Slip to Dover st., M. T. & T. Co.,
 Nassau street, Wall to Pine streets, M. T. & T. Co.,
 46th street, Eighth to Third avenues, M. T. & T. Co.,
 Wall street, Nassau to William streets, M. T. & T. Co.,
 Murray street, College place to Broadway, Fire,
 Elm street, Reade to Grand streets, owner unknown.

H.

Streets where the Western Union Telegraph Company has lines which it will remove, according to its agreement:

Seventh avenue, 26th st. to Greenwich avenue,
Church street, Canal to Murray streets,
Fulton street, Gold to Pearl streets.

L.

Streets where the Metropolitan Telephone and Telegraph Company has lines which it will remove itself, according to its agreement:

Broad street, Wall street to Exchange place,
Cedar street, Church street to North River,
John street, Nassau street to near Broadway,
Barclay street, College place to West street,
Murray street, College place to Broadway,
Centre street, Reade to Grand streets,
Cliff street, Frankfort to John streets,
38th street, Lexington to First avenues,
58th street, Eighth to Tenth avenues,
Tenth avenue, 58th to 59th streets,
Lexington avenue, 65th to 79th streets,
79th street, First to Fourth avenues,
57th street, Tenth to Third avenues,
46th street, First to Eighth avenues,
41st street, Broadway to Sixth avenue,
19th street, Seventh to First avenues,
Amity (W. 3d st.), Sixth to So. Fifth avenue,
Bleecker street, Downing to Greene streets,
Prince street, Macdougall street to Bowery,
Church street, Canal to Barclay streets,
Warren street, West street to College place,
Liberty street, West to Gold streets,
Nassau street, Wall to Pine streets,
Dey street, Broadway to Greenwich street,
Fulton street, Greenwich to Front streets,
45th street, Sixth avenue to Broadway,
45th street, Sixth to Vanderbilt avenues,
Hester street, Centre to Chrystie streets,
Elm street, Reade to Grand streets,
Baxter street, Worth to Grand streets.

M.

Streets which can be cleared of electric light wires as soon as the heat in the subways is overcome:

Fulton street, Broadway to Washington street,
Washington street, Cortlandt to Fulton streets.

O.

Streets which can be cleared of electric light wires as soon as the sixty days' extension of time granted by the Board has expired:

Broadway, 14th street to Bowling Green,
Bowery and Third avenue, Chatham sq. to Harlem River.

The Board considered the report of Dr. Wheeler, ordering it placed on file, and directing him to make up a list from it of lines that can be ordered down at once, for Mayor Grant. Pending the consideration of the report, the United States Illuminating Company and the East River Electric Light Company, through their respective representatives, agreed to take down within the next two weeks any lines belonging to them in the following streets: 23d street from Sixth avenue to Eighth avenue; 42d street from Broadway to First avenue; Houston street from First avenue to Hancock street. The representatives of the United States Company stated that its lines were down in 59th street from First to Eighth avenue and in Seventh avenue from 46th to 59th street.

The following communication was read:

NEW YORK, May 6th, 1890.

HON. HUGH J. GRANT, Mayor, and Chairman, Board of Electrical Control:

DEAR SIR:—FOR the information of your Board I have the honor to state that, under date of the 29th ultimo, I notified the Consolidated Telegraph and Electrical Subway Company that they had failed to fulfill the promises made to your Board and to me to proceed with the construction of electrical subways in the streets which are about to be paved so as to obviate the necessity of tearing up and injuring the new pavements on account of subway construction. To this no response has been made by the Company either by letter or by making the needed progress in their work, and I have written to the Company again to-day stating that I am compelled to consider this a disregard of their obligations to the public, and of the authority of this Department, and gave them final notice that unless I received assurance or evidence this week that they will vigorously proceed with the construction of subways in the streets which are to be paved, I shall order the paving works to be proceeded with and shall thereafter withhold permits for opening any of such streets for subway construction.

My object in bringing this matter to your attention is to secure the co-operation of your Board for the purpose of obtaining more rapid progress in the construction of the electrical subways in the streets where new pavements are to be laid, and I hereby respectfully ask such co-operation.

Very respectfully,

THOS. F. GILROY, Commissioner of Public Works.

Mr. Ridgway (Vice-Pres. Con. Tel. and Elec'l S'way Co.): In connection with that matter I would state that all these various electric light companies have sent in notices of withdrawal of applications heretofore made in some of the streets, and the matter is now under adjustment for the purpose of having a revised list made. That will be submitted to the Commissioner of Public Works within a week. Since that letter was written work has been opened up at some five or six points—Broad street, Lexington avenue, Eighth avenue, Madison avenue, and one or two other points.

The following report of Engineer Kearny was read :

NEW YORK, May 14th, 1890.

To the Honorable, The Commissioners of the Board of Electrical Control :

GENTLEMEN :—The construction of subways, under resolution of the Board of April 8th, has been begun on Whitehall street, on Eighth avenue from 14th street north, on Lexington avenue from 32d street north and 86th street south, on Madison avenue from 41st street north, on Leonard street, and on Murray street.

The various electric light companies have made application for space in some of the streets required by them, which have been referred to the Construction Company by me, with instructions to proceed with the construction of the same as soon as a satisfactory bond for occupancy has been furnished to them—which is my understanding of my duty under resolution of April the 8th.

Very respectfully,

HENRY S. KEARNY, Engineer.

Engineer Kearny: I might say in explanation that I have several letters—one from the Manhattan Company as late as May 5th withdrawing its application for subway on Eighth avenue. This is the second letter from the Manhattan Company withdrawing applications for subways to be built. You can see it is a little difficult to say how much to build.

Mr. Browne: I will answer for the United Electric Light and Power Company. We have sent in to Col. Kearny a list of our applications for the streets to be repaved. This one covers the streets called for by the Edison Company and provided for in your resolution that subways for the other companies shall be built at the same time as those of the Edison Company. Our former list comprised all those that were to be repaved. We have not withdrawn anything.

Judge Kelly (of East River E. L. Co.): We have stated all we desire to have, and we have no withdrawals.

Mr. May (Pres. Mt. Morris E. L. Co.): I put in one more for Beaver street to-day.

Mayor Grant: Is the Manhattan Company represented here?

Commissioner Hess: The Manhattan Company is very profuse in its applications. It was going to occupy all the streets, and now it does not want any.

Judge Kelly: We were requested to go to the American Surety Company and get them to give a bond for our Company, and I saw them to-day, and the price which they wish to charge is satisfactory, but they want us to deposit the amount of \$50,000 in cash, or give them a mortgage on realty, or deposit bonds of that amount. It is preposterous, ridiculous. We will give them one good freeholder who holds realty in New York as our bondsman. We think that is as much as anybody ought to ask.

Mr. Cohen: We have not named any company or person. We have said there should be two sureties.

The Board considered the question of what was proper security, hearing Judge Kelly, Mr. Cohen, Mr. Ridgway and others on the subject, and

Mayor Grant stated that, in case the companies failed to agree, he would call a meeting for Friday to settle the matter.

Mayor Grant also stated, at the close of some discussion and hearing as to the right of prohibiting the use of extra ducts in subways to companies which had not applied for space in such subways previous to their construction, that between now and Friday he would endeavor to obtain from the Corporation Counsel some sort of a communication as to that, and to whom these extra ducts shall go, so that he might inform the Board.

Mayor Grant offered the following resolution:

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company now before the Board, and approved by the Expert, for individual telephone connections in districts where there are no subways, be granted.

Unanimously adopted.

The following report of Engineer Kearny was read, and ordered placed on file:

NEW YORK, May 14th, 1890.

To the Honorable, The Commissioners of the Board of Electrical Control:

GENTLEMEN:—Concerning W. C. Humstone's letter of April 16th, which was referred to me at the last meeting of the Board for investigation, I have to report that I have consulted with Mr. Humstone, Superintendent, and J. Elliot Smith, Superintendent of Fire Department Telegraph, and am informed by Mr. Smith that the requirements of the Fire Department at the present time are such as that they cannot dispense with any of the poles mentioned in Mr. Humstone's letter as being released until near the end of this summer, or until such time as a contract that has been entered into by the Fire Department for a cable to take the place of these lines has been furnished and connected up in the subways. Most of the poles referred to are the property of the City of New York for the use of the Fire Department and others that they may allow to use them.

Very respectfully,

HENRY S. KEARNY, Engineer.

Commissioner Hess offered the following resolution:

Resolved, That the Electrical Expert be and he is hereby authorized to re-appoint for a period of thirty days the four temporary inspectors now employed—appointment to date from the expiration of their last thirty days' appointment.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday, May 16th, 1890, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

The following communication was read:

NEW YORK, May 15th, 1890.

MR. HENRY S. KEARNY, Engineer, Board of Electrical Control, New York City, New York:

DEAR SIR:—The fact that one of the principal electric lighting companies has withdrawn all its applications for ducts, and other changes with regard to the subways proposed to be constructed have so confused the matter that we do not feel justified in allowing our previous application for subways, made under different conditions, to stand without change. As it will probably breed confusion to amend the list of applications already filed, the simpler course for us seems to be to withdraw all applications heretofore made for space in subways not yet constructed, and we hereby notify you and the Board of Electrical Control that all our applications for space in subways not yet constructed are hereby withdrawn.

Our engineers are at work to-day upon a new statement of our requirements, which will be furnished you at the earliest possible day.

We think you will agree that the course which we have adopted is simpler for all concerned than an attempt to amend the lists already furnished you.

We have sent a copy of this letter to the President of the Consolidated Telegraph and Electrical Subway Company.

Yours very truly,

THE UNITED ELECTRIC LIGHT AND POWER COMPANY,
by C. H. JACKSON, President.

THE UNITED STATES ILLUMINATING COMPANY,
By JOSEPH W. HUNTLEY, Secretary and Treasurer.

THE BRUSH ELECTRIC ILLUMINATING COMPANY,
By G. M'FALL, Secretary and Treasurer.

The Board discussed the communication of the United, United States and Brush Companies, and the subject of applications for space in subways generally, hearing Mr. Jackson and Mr. Cravath, of the above-named Companies, Mr. Leslie, of the Manhattan Company, and Mr. Lauterbach and Mr. Cohen, of the Construction Company, and

An adjournment until Monday was agreed to, with the understanding that every Company will have its applications ready at that time.

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Mayor Grant brought to the attention of the Board and had read the following communication from the Police Department:

POLICE DEPARTMENT OF THE CITY OF NEW YORK,

NEW YORK, May 13th, 1890.

HON. HUGH J. GRANT, Chairman of Board of Electrical Control:

DEAR SIR:—The Board of Police have directed us to forward herewith a copy of the report of Commissioner Voorhis, Chairman of the Committee on Repairs and Supplies, stating the refusal and neglect of the Consolidated Telegraph and Electrical Subway Company to assign, for the use of this Department, a duct for its wires to be placed in the subways, contract for which was made with the Standard Underground Cable Company in October last.

In accordance with the recommendation of the Committee, the Board of Police respectfully request that the Board of Electrical Control will adopt such measures as will lead to an immediate assignment by the Consolidated Telegraph and Electrical Subway Company of a duct for the use of the cables or electrical conductors of the Police Department.

Accompanying the report, and also inclosed, is a copy of the correspondence in relation to the assignment of a duct for such cables.

Very respectfully,

W. H. KIPP, Chief Clerk.

NEW YORK, May 12th, 1890.

To the Board of Police, Police Department of the City of New York:

GENTLEMEN :—The Committee on Repairs and Supplies, to whom was referred the communication from the Standard Underground Cable Company, bearing date December 12th, 1889, relative to the assignment of a duct for the electrical conductors of the Police Department in certain electrical subways, specified in a contract between the Department of Police and the Standard Underground Cable Company—as also of several subsequent communications from the same Company, relative to the same matter, in like manner so referred, respectfully report: That the committee have held repeated conferences and extensive correspondence with the representatives of the Consolidated Telegraph and Electrical Subway Company, with the view and purpose of obtaining an assignment of the necessary space in certain of the electrical subways of this city for the electrical service of the Police Department, wherein the necessities of the police electrical service in the subways were most fully set forth, as will appear, it is believed, by the accompanying correspondence herewith submitted.

Notwithstanding the repeated and urgent solicitations of your Committee for prompt and affirmative action on the part of the Consolidated Telegraph and Electrical Subway Company in relation to setting apart and designating the necessary space in the subways for the use of the Police Department electrical conductors, the said Consolidated Telegraph and Electrical Subway Company have neglected and refused—and still do neglect and refuse—to assign the necessary space in the electrical subways for the use of the Police Department, as frequently requested and notified.

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Your Committee therefore recommend that the Board of Electrical Control be placed in possession of the facts herein recited, with a request that the said Board adopt such measures as will lead to an immediate assignment by the Consolidated Telegraph and Electrical Subway Company of a duct for the use of the cables or electrical conductors of the Police Department.

Respectfully submitted,

(Signed.)

JOHN R. VOORHIS,

Chairman of the Committee on Repairs and Supplies.

("Correspondence" referred to.)

POLICE DEPARTMENT,

NEW YORK, NOV. 25, 1889.

Standard Underground Cable Company:

GENTLEMEN:—Your communication of the 22d inst., stating that you are now ready and waiting to proceed with the underground cable work, is at hand and will be presented to the Board at its meeting to be held to-morrow. Meanwhile will you please state that you will guarantee to use the duct already reserved for the Police and Fire Departments (and into which you have already placed a cable for the Fire Department) for the placing therein of the cable for this Department, providing that the Consolidated Telegraph and Electrical Subway Company grant permission for the use of such duct.

Very respectfully,

(Signed.)

WILLIAM H. KIPP,

Chief Clerk.

STANDARD UNDERGROUND CABLE COMPANY,

NEW YORK, NOV. 25, 1889.

WM. H. KIPP, Esq., Chief Clerk Police Commissioners:

DEAR SIR:—In reply to your favor of this date, we are entirely unable to promise, as you request, that we will guarantee to use "the duct already reserved for the Police and Fire Departments and in which we have already placed" a cable for the Fire Department. The only way any more cables can now be placed in the duct in which the Fire Department cables are already laid is by cutting the Fire Department cables, drawing them out and drawing them in again with the cables of the Police Department; to draw the Police Department cables over the Fire Department cables as they stand is entirely impracticable; and apart from any objection that we may suggest as pertaining to the work itself, the Fire Department will certainly protest strongly against permitting any other cables to be drawn over theirs. I state this in relation to the Fire Department without authorization to make any statement for them; I therefore give it only as my opinion based upon very complete knowledge of the case.

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The only way in which your Department can get the satisfactory results that they expect and desire in underground subways is by having a separate duct set apart for the use of your Department.

Your letter refers to the duct already reserved for the Police and Fire Departments, in relation to this I beg to submit that there is no such duct strictly as such; there are several ducts in use by the Fire Department, but they were not "reserved for the Police and Fire Departments."

Very respectfully,

(Signed.)

G. L. WILEY, Mgr.

EXECUTIVE OFFICES OF
THE CONSOLIDATED TELEGRAPH AND ELECTRICAL SUBWAY COMPANY,
No. 18 CORTLANDT STREET.

NEW YORK, Dec. 2d, 1889.

HON. JOHN R. VOORHIS, Police Commissioner:-

DEAR SIR:—Referring to my conversation with you a few days since, in regard to the question of allotment of space in the subways of this company for occupancy by electrical conductors of your department, you will please find tables enclosed which I have prepared showing the space applied for by you, as well as that asked for by your department in sections where ducts have already been assigned to the Fire Department.

The system of subways laid by this company is almost wholly of $2\frac{1}{2}$ inch ducts having a capacity of 75 conductors and the number of conductors required by you range from 2 to 19; while those of the Fire Department range from 4 to 26, so that a combination of the greatest number in one place would be 45, leaving a capacity for 30 conductors unoccupied.

As you are familiar with the subject it is unnecessary for me at this time to go into further details than to express my belief that if some arrangement were made between yours and the Fire Department by which either a combination cable, or separate cables for each Department, can be drawn into the same duct that such a course would most economically accomplish the result desired.

Hoping to hear from you, I am,

Very truly yours,

(Signed.)

E. L. RIDGWAY, Gen'l Manager.

NEW YORK, Jan. 29, 1890.

HON. JOHN R. VOORHIS:

DEAR SIR:—Will you please inform me if you have sent an invitation to the Commissioners of the Fire Department to meet with the Police Commissioners at your office on the subject of the joint occupancy of the subways.

You will remember that at a conference held at your office on the 13th instant, it was understood that such an invitation would be sent and when the time of

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meeting was fixed you would notify me in order that I might appear with the electrician of this Company for the purpose of reaching an agreeable solution of the question.

Very truly yours,

(Signed.)

E. L. RIDGWAY, Gen'l Mgr.

NEW YORK, Feb. 8th, 1890.

MAJOR WM. H. KIPP, Chief Clerk, Police Department:

DEAR SIR:—In conformity with my letter to you under date of 4th instant the question of the assignment of space in the subways was brought before the directors of this company at a meeting held on Thursday last, and I was instructed to communicate with your Department on the subject.

Pursuant to Section 4 of the contract, dated April 7th, 1887, between this Company and the Commissioners of Electrical Subways, representing the City of New York, this Company is required to furnish, without charge, the space necessary for the electrical conductors of the city and of its departments.

This company has at all times been ready to comply with the requirements of its contract, and if you will indicate the diameter of the cables that you propose to place in the subways at various points we will give the necessary instructions.

Awaiting your reply, I am,

Very respectfully,

(Signed.)

E. L. RIDGWAY, Gen'l Mgr.

NEW YORK, Feb. 28th, 1890.

E. L. RIDGWAY, General Manager of the Consolidated Telegraph and Electrical Subway Company:

DEAR SIR:—In reply to yours of the 8th instant, referring to the question of assignment of space for the use of the Police Department of this City in the electrical subways, wherein you state that this Department "will indicate the diameter of the cables that it proposes to place in the subways at various points, the necessary instructions will be given"—I would respectfully state that the diameter of the cables proposed to be placed in the subways which are deemed necessary for the service of the Police Department will be variable at different points, and subject to frequent additions or enlargements, but that for the present necessities of the department an assignment of one duct in the subways constructed on the line of the streets mentioned in a previous communication to your company is absolutely necessary for the proper conduct of its electrical service, and such assignment you are again respectfully requested to make, and kindly inform this department thereof at as early a date as possible.

Respectfully yours,

(Signed.)

JOHN R. VOORHIS,

Chairman Committee on Repairs and Supplies.

[MAY 16, 1890.]

NEW YORK, March 4th, 1890.

HON. JOHN R. VOORHIS, Chairman of the Committee on Repairs and Supplies:

DEAR SIR:—Yours of the 28th ultimo regarding the allotment of space in the subways of this Company for the electrical conductors of your department is received.

You state in the communication above referred to "that the diameters of the cables proposed to be placed in the subways and which are deemed necessary for the service of the Police Department will be variable."

It is respectfully submitted that the request made in my letter to your Chief Clerk, under date of the 8th of February, had reference to the cables which had already been contracted for by your Department and which you desire to have placed in the subways at the various points respectively, as designated in your letter of November 18th, 1889.

Inasmuch as the number of conductors required must have been specified in the contract governing their manufacture and the intended location for their operation known, the diameters of these various cables should be easily ascertainable, and I will be obliged to you if you will please forward the information requested.

Very truly yours,

(Signed.)

E. L. RIDGWAY,
Vice-Prest. & Gen'l Mgr.

NEW YORK, March 11th, 1890.

E. L. RIDGWAY, Vice-Pres't, &c.:

DEAR SIR:—Replying to yours of the 4th instant, I respectfully state that the contract made on behalf of the Police Department for the furnishing and placing of electrical conductors necessary for its service and use in the electrical subways does not specify the diameter of the cables to be supplied, nor is there any limitation or restriction as to the diameter thereof, other than such as may be necessary to ensure a perfect insulation of the conductors.

I am informed, however, by the contractors, that to ensure good service and a proper working of the police electrical system of this city, it is absolutely necessary that a separate conduit therefor should be provided, say of $2\frac{1}{2}$ inches in diameter, which I believe is the diameter of your smallest conduits.

As the Board of Police have been again called upon this day to provide such a conduit to the contractors for placing its wires underground, I can but reiterate the request that your Company will without delay assign the same as heretofore requested, and thus enable the contractors to fulfill the terms of their agreement, and this Board to, so far as they can, comply with the spirit and intent of the law pertaining to the placing of electrical wires underground, which I regret to say is being very much delayed by the failure on the part of the company you represent to designate and furnish to this department as requested the necessary facilities and space required for its use in the constructed subways under your supervision and control.

Respectfully yours, -

(Signed.)

JOHN R. VOORHIS,
Chairman Committee on Repairs and Supplies.

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NEW YORK, March 12th, 1890.

HON. JOHN R. VOORHIS:

DEAR SIR:—In response to your communication under yesterday's date, while I am well aware from the information which you furnish me that no "limitation" or restriction as to the diameter of cable to be used by your department may have been specified to the manufacturers, yet inasmuch as your letter requests the assignment of space in the subways and suggests that this Company is delaying matters by not making such assignment, it is indicated that the cables are now completed and ready to be placed in the subways. If this be so, as indicated in my letter of the 4th instant, there should be no difficulty in ascertaining the exact diameter of such cable to be placed at various points, and it therefore becomes incumbent on me again to most respectfully request that this information be furnished.

I am, however, constrained to express some surprise that even a suggestion should be made that this company is in any way delaying a solution of the subject, as we have been at all times ready to meet the requirements of law without objection, and as a proof of this, you are referred to my letter of Feb. 8th, in which this information was then requested, but without effect.

Hoping that you will see the necessity of giving this Company the information desired, without further delay, I am,

Very truly yours,

(Signed.)

E. L. RIDGWAY,
Vice-Prest. & Gen'l Mgr.

NEW YORK, March 18th, 1890.

E. L. RIDGWAY, Vice-President, &c., 18 Cortlandt street:

DEAR SIR:—In reply to your communication of the 12th instant, I beg most respectfully to write that I thought I had stated as distinctly as possible in my previous communications to you upon the subject the necessities of the Police Department with reference to space required in the subway conduits for its electrical service; but, that there may be no misunderstanding on the subject, would again state that after exhaustive consultation with electrical experts of experience and long service, including the electrical superintendents of both the Fire and Police Departments, it is the unanimous conclusion of the Board of Police that for the necessities of the Police Department it is absolutely requisite that one of the conduits of the electrical subways as at present constructed should be assigned on the line of the streets for which application was made by this department months ago.

Trusting that affirmative action will be taken on this long deferred matter, and that thereby the Police Department may be enabled, without any further delay, to make use of the privileges of the subways that the laws provided, and that you will promptly advise this Department of your action thereon, I remain,

Respectfully yours,

(Signed.)

JOHN R. VOORHIS,
Chairman Committee on Repairs and Supplies.

NEW YORK, April 10th, 1890.

HON. JOHN R. VOORHIS:

DEAR SIR:—In response to your letter of March 18th, relating to the subject of "the necessary space" in the subways required for the use of the electrical conductors of the Police Department, I regret that a reply should be so long delayed, but as your department seemed averse to furnishing the needed information with respect to the diameter of the cables for which application was made for the space, such delay was not well to be avoided.

Having obtained the information, which shows that the cables contracted for by your department are from $\frac{3}{8}$ to $\frac{7}{8}$ of one inch in diameter, and it having been further demonstrated that no mechanical or electrical difficulties exist which will prevent them from being drawn in the same duct over the cables of the Fire Department or that such a course will offer any obstruction in successfully operating them after being so placed, there seems to be no cause for further delay in making the assignment of the necessary "space" required in the subways for the electrical conductors of your department. I would therefore most respectfully state that Mr. Beckwith, our Chief Engineer, through whom your department has made application for space in the subways, has been accordingly advised and directed to make such assignment of the "necessary space" for the electrical conductors of your department in the duct intended for the use of the city departments and wherein "space" has already been assigned for the cables of the Fire Department and which duct is now only partially occupied by the electrical conductors of such department.

I remain,

Respectfully yours,

(Signed.)

E. L. RIDGWAY,

Vice-Prest. & Gen. Manager.

E. L. RIDGWAY, Esq., Vice-Pres't, &c.:

DEAR SIR:—Your communication of the 10th ultimo was duly received, wherein you state that your Chief Engineer, Mr. Beckwith, "has been advised and directed to make assignment of the necessary space for the electrical conductors of this Department in the duct intended for the use of the city departments, and wherein space has already been assigned for the cables of the Fire Department," etc., etc.

Inasmuch as this practically ignores and denies the request of the Police Department, made long since and frequently repeated during the last five or six months that you cause to be assigned to the Police Department necessary space in the subways under your control, for the placing and operating, in an efficient manner, of the electrical conductors required for the service of this Department, I shall so report to the Board of Police in order that it may take such further action in the premises as it may deem necessary and proper.

Respectfully yours,

(Signed.)

JOHN R. VOORHIS,

Ch'n Comm'ee on Repairs and Supplies.

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NEW YORK, May 12th, 1890.

HON. JOHN R. VOORHIS:

DEAR SIR:—Your favor under date of 10th instant has just been received, and before presenting your request to the Board of Police I respectfully submit that it is very desirable that no misconception of the position of this company be had in the premises.

As I wrote you on the 10th ultimo, the Chief Engineer of this company was instructed to assign to the Police Department the necessary space in the subways for the proper accommodation of its electrical conductors, and since that time our Chief Engineer has made the assignment accordingly.

It seems now to be only a question of what is necessary space for such occupancy.

By tests which we have made it has been fully demonstrated that there is neither any mechanical nor electrical objection to placing additional cables containing electrical conductors in a duct heretofore partially occupied by other cables, and as this is so your request did not embody the requirements of the department but simply expressed your preference for separate ducts.

The proof that there is not and has not been any disposition on the part of this company to either ignore or deny the request of your Board for the necessary space in the subways is that the assignment has already been made, and I cannot believe that the Police Department wish to entail any hardships on this company in the way of asking for space that is not absolutely necessary.

Believing that a closer examination and consideration of this subject will lead you to the same conclusions that have resulted to us after making careful tests, and again expressing the desire we have to meet the requirements of your Department in this matter, I remain,

Very respectfully yours,

(Signed.)

E. L. RIDGWAY,

Vice-Prest. and Gen't Manager.

The following communication from the Police Department was also read:

NEW YORK, May 14th, 1890.

HON. HUGH J. GRANT, Mayor of New York:

DEAR SIR:—Referring to your favor of the 7th inst., requesting that the Board of Electrical Control be informed when certain wires strung overhead in streets where subways have been completed can be removed, the Board of Police have directed me to enclose herewith a copy of the report of the Superintendent of Telegraph stating the reasons why such wires cannot be removed.

Very respectfully,

WM. H. KIPP, Chief Clerk.

("Report of Superintendent of Telegraph.")

NEW YORK, May 12th, 1890.

To the Honorable Board of Police Commissioners:

GENTLEMEN:—In regard to the communication from His Honor the Mayor to Hon. Charles F. MacLean, President Board of Police, dated 7th instant, relative to certain Police Department wires being allowed to remain on poles where the subways are completed, I respectfully report that inasmuch as the application of the Board of Police to the Consolidated Telegraph and Electrical Subway Company for necessary space for the electrical conductors of the Police Department in the Electrical Subways has, up to the present time, been ignored, it is not feasible to place when desired the wires of the department in the subways where constructed. It is of great importance that both lines of wires referred to in the communication from His Honor should be maintained and interfered with as little as possible, as they are located in that portion of the city which requires that every facility be at hand so that prompt notice be given to the police in any emergency. I would therefore respectfully state that, in my opinion, it would be inadvisable to remove the wires referred to from their present location until they are properly provided for in the Electrical Subways.

Very respectfully,

JAMES CROWLEY, Supt. Tel.

The Board considered the communications of the Department of Police and the matter in dispute between that Department and the Consolidated Telegraph and Electrical Subway Company, and heard arguments—by Fire Commissioner Robbins, in support of the position taken by the Departments of Police and Fire, and by Mr. Lauterbach and Mr. Cohen, in support of the position of the Consolidated Company; and

On motion of Mayor Grant, the matter was referred to Engineer Kearny and Expert Wheeler, to report at the next meeting.

Commissioner Hess moved the following resolution amendatory of his resolution of May 14th relative to inspectors:

Resolved, That the Electrical Expert be and is hereby authorized to appoint four temporary inspectors, and to select the same from the full list received from Civil Service Board, for a period of thirty days, the appointments to date from date of their selection.

Unanimously adopted.

An application of the Metropolitan Telephone and Telegraph Company, dated May 15th, 1890, to string one 28-conductor aerial cable from pole at 45th street and Vanderbilt avenue to Windsor Hotel, was referred to Engineer Kearny.

The Board hereupon adjourned to Monday, May 19th, 1890, at 11 o'clock A. M.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Monday, May 19th, 1890, at 12 o'clock M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant stated that he was informed that the United Electric Light and Power Company and the Mount Morris Electric Light Company had just put in their applications for subways.

Engineer Kearny: I have not had time to read them.

Mayor Grant further stated that he had understood that these applications were to be put in, in time for the Engineer's consideration and report, so that the Board might act upon them at this meeting, and deprecated the continual delay in respect to applications for subways; addressing Commissioner Gilroy, he said that the only thing for him to do was to go on with his paving, and to refuse to grant permits to open newly paved streets.

Commissioner Gilroy: And leave the responsibility to the courts?

Mayor Grant: I think there is nothing else to do.

Commissioner Gilroy: I want to call this Board's attention to the fact that Broadway is to be repaved from Bowling Green to 14th street; that this Board some six weeks ago ordered a subsidiary duct to be built along the west side of Broadway, for the purpose of accommodating storekeepers on that side with electric light, and, so far as I can ascertain, not one step has been taken in that direction. If I undertake to pave Broadway now, I will be delayed by the orders of this Board to build that duct.

Mayor Grant: What have the gentlemen of the Consolidated Company got to say about that?

Mr. Ridgway (of the Consolidated Company) stated that the material that was ordered for the Broadway duct had been put into the construction of the Madison avenue, Lexington avenue, and other subways, which he enumerated.

Mayor Grant: Is there any material?

Mr. Ridgway: Oh, yes, there is more material, and we will be ready to go on with that work very shortly.

Mayor Grant: What do you call shortly?

Mr. Ridgway: I could not tell you exactly how soon; and I do not want to make a promise that there will be a dispute about hereafter.

Commissioner Gilroy complained to the Board of the present system of making hand-holes, stating that after a subway is built in a street which is afterward repaved there is no security against the digging up of the new pavement for the purpose of making house connections from these hand-holes, which are placed on the line of the subway at intervals of every fifty feet.

The Board considered the matter, hearing the views and suggestions of Commissioner Gilroy and Engineer Kearny,

Mayor Grant disposing of it, by offering the following resolution:

Resolved, That the Engineer of this Board be requested to recommend, at the next meeting of the Board, for its adoption, some system of house connections that will not cause the continual tearing up of the streets after they have been repaved.

Which resolution was unanimously adopted.

Mayor Grant gave notice that, at the next meeting of the Board, he would move a revocation of any authorizations for subways in such streets as it appeared repaving had commenced and subway construction was not already proceeding.

The following applications of the United Electric Light and Power Company and the Mount Morris Electric Light Company, before referred to, were hereupon read:

NEW YORK; May 19th, 1890.

COL. HENRY S. KEARNY, Engineer, Board of Electrical Control, New York City, N. Y.:

DEAR SIR:—Referring to our letter of the 15th inst., in which we withdrew all applications made prior to that date for space in subways not yet constructed, we now beg, in accordance with our promise, to hand you herewith a new list of our requirements, which cover the wants not only of our own company, but those of the United States Illuminating Company and the Brush Electric Illuminating Company as well. This list refers to all the ducts that we have been able to definitely determine upon, up to the present time. We will, from time to time, in anticipation of the paving of streets by the Commissioner of Public Works, and the opening of streets for Edison ducts, furnish you statements of our further requirements.

We are anxious that the subways referred to in this list be completed as soon as possible, and will agree to occupy the same as soon as they are ready for occupancy; that is to say, as soon as they have been completed and have been connected with the trunk lines reaching our respective stations.

We have already made arrangements satisfactory to the Consolidated Telegraph & Electrical Subway Company for securing the payment of the rentals for these ducts.

Our requests for subways have been based upon the theory that subways are to be constructed upon one side of the street (except in the case of special streets) with crossings from house service box or manholes to the curb on the opposite side of the street as required.

We will endeavor, in the case of the streets about to be repaved, to advise you at once of our needs in the way of such crossings, so that they can be constructed before the repaving is begun.

Whenever you are about to open streets for the construction of subways, we should be glad if we could be notified. We would then decide very promptly whether or not we wish a duct in that particular street. We remain,

Very truly yours,

THE UNITED ELECTRIC LIGHT & POWER COMPANY,

By C. H. JACKSON, President.

Street	From	To	3" Distribution ducts	3" main ducts
Bowling Green	State St.	Whitehall St.	1 S. S.	
Beaver	Pearl	Broadway	2 N. S.	
West St.	Liberty	Vesey St.	2 E. S.	
Liberty	Broadway	West	1 N. S.	
Cortlandt St.	Broadway	West	1 N. S.	
Dey	Broadway	West	1 N. E.	
Fulton	Washington	West	1 N. E.	
Vesey St.	Broadway	West	1 N. E.	
W. Broadway	Chambers	Canal	2 E. S.	
Greenwich	Vesey	Chambers	3 E. S.	
Barclay	Broadway	Greenwich	1 N. S.	
Park Place	Broadway	Greenwich St.	1 each side	
Murray	Broadway	Greenwich	1 N. S.	
Warren St.	Broadway	Greenwich	1 N. S.	
Chambers	Centre St.	Greenwich	2 N. S.	4 N. S.
Reade	Centre	Elm St.	1 S. S.	
Duane	Broadway	W. Broadway	1 N. S.	
Thomas	Broadway	Church	1 N. S.	
Worth	Broadway	W. Broadway	1 S. S.	
Franklin St.	Broadway	W. Broadway	1 N. S.	
White Street	Broadway	W. Broadway	1 N. S.	
Walker Street	Broadway	W. Broadway	1 N. S.	
Park Row	Broadway	Frankfort	2 E. S.	
4th avenue	14th St.	17th St.	1 E. S.	
Centre St.	Park Row	Reade St.	2 W. S.	
4th avenue	17th St.	32d St.	2 each side	
3d avenue	6th St.	59th St.	2 E. S.	
23d St.	3d avenue	Broadway	4 S. S.	
42d St.	Broadway	8th avenue	2 S. S.	2 S. S.
14th St.	6th avenue	8th avenue	4 S. S.	
Bowery	Chatham Sq.	6th St.	2 E. S.	
Whitehall St.	Beaver	Bridge		3 E. S.
Whitehall St.	Bridge St.	So. Ferry		2 E. S.
Whitehall St.	Beaver	So. Ferry	1 E. S.	
Madison Ave.	41st St.	58th St.	2 E. S.	
Thomas St.	Church St.	Hudson St.	1 S. S.	
Howard St.	Broadway	Mercer St.	1 N. S.	

Street	From	To	3" Distribution ducts	3" main ducts
Greenwich Ave.	8th Ave.	W. 13th St.	2 E. S.	
Horatio St.	Greenwich Ave.	W. 4th St.	1 N. S.	
Cliff St.	Ferry St.	John St.	2 E. S.	
Platt St.	Pearl St.	William St.	1 N. S.	
Stone St.	William St.	Broad St.	1 E. S.	
Broad street	Exchange Pl.	Pearl St.	1 W. S.	
Elizabeth St.	Brush St.	Spring St.	2 E. S.	
Elizabeth St.	Houston	Prince St.	4 E. S.	
Reade St.	Elm St.	Washington St.	1 S. S.	
Leonard St.	Broadway	Hudson St.	1 S. S.	
Lexington Ave.	42d St.	50th St.	2 E. S.	
Broome St.	Centre St.	Broadway	2 S. S.	
Spring St.	Bowery	Broadway	2 N. S.	
Broad St.	Wall St.	Exchange Pl.	1 W. S.	
So. William St.	William	Broad	1 E. S.	
William St.	Wall	Frankfort	1 E. S.	
Pearl St.	Fulton	Oak St.	2 E. S.	
New Bowery	Oak	Chatham	2 E. S.	
Park Row	Frankfort	Chatham St.	2 each side	2 E. S.
Harrison St.	Hudson	Washington St.	1 N. S.	
Catharine	Division	Cherry St.	2 E. S.	
Little W. 12th	Washington	10th Ave.	1 E. S.	
Broadway	Bowling Gr.	14th St.	3 W. S.	
Canal St.	Hudson St.	Bowery	2 each side	
Greenwich St.	Chambers St.	Canal St.	1 E. S.	2 E. S.
8th avenue	13th St.	45th St.	2 each side	
Hanover St.	Pearl St.	Exchange Pl.	2 S. S.	
Exchange Pl.	Hanover St.	William St.	2 S. S.	
William St.	Beaver St.	Wall St.	1 W. S.	
58th St.	5th Ave.	6th Ave.	1 S. S.	
58th St.	Madison Ave.	5th Ave.	1 S. S.	

NEW YORK, May 17th, 1890.

COLONEL H. S. KEARNY, Engineer, Board of Electrical Control, 1266 Broadway, New York:

DEAR SIR:—In compliance with the resolution passed at the meeting of your Board May 16th, 1890, we beg to enclose herewith a list of the streets in which we are particularly anxious to have subways constructed at your earliest convenience:

Whitehall street, Beaver to South Ferry,	E. S.	1 dist'n
Wall street, Broadway to Pearl,	S. S.	1 "
Thomas street, Broadway to Hudson,	S. S.	1 "
Broad street, Wall to Pearl,	W. S.	1 "
Reade street, Elm to Washington,	S. S.	1 "
Leonard street, Broadway to Hudson,	S. S.	1 "
So. William street, Broad to William,	E. S.	1 "
William St., Frankfort to So. William,	E. S.	1 "

Canal street, Hudson to Bowery,	N. S.	2 dist'n
" " Hudson to Bowery,	S. S.	2 "
" " Greenwich to Hudson,	S. S.	2 "
" " " " "	N. S.	2 "
Greenwich street, Canal to Fulton,	E. S. 4 main	1 "
" " " to Vandam,	E. S. 11 main	1 "
Howard street, Broadway to Mercer,	S. S.	1 "
Broadway, 14th St. to Bowling Green,	W. S.	1 "
W. Broadway, Canal to Barclay,	E. S.	1 "
Church street, Canal to Liberty,	E. S.	1 "
Mercer street, Canal to Eighth St.,	E. S.	1 "
Greene street, Canal to Eighth St.,	E. S.	1 "

These have already been applied for in greater part, and we hope their construction will be commenced at once and pushed to completion.

Yours very truly,

THE MOUNT MORRIS ELECTRIC LIGHT CO.,

EDWARD MAY, President.

P. S.—We also wish to withdraw all other applications previously made, and to substitute this list therefor. From time to time we will furnish additional lists of our requirements.

MOUNT MORRIS E. L. CO.,

By EDWARD MAY, President.

Mayor Grant stated that the Edison Company, which was willing to proceed with its construction of subways, ought to be permitted to do so, and that he would sustain it in an application to the Construction Company for permission to build its subways immediately.

The Board, in the absence of a representative from the Fire Department, upon the suggestion of Commissioner Hess, postponed to the next meeting the hearing and consideration of the report of Engineer Kearny and Expert Wheeler upon the matter in difference between the Consolidated Telegraph and Electrical Subway Company, on the one side, and the Fire Department and the Police Department, on the other regarding the allowance of space in the subways to those Departments, and

On motion of Mayor Grant, the following resolution:

Resolved, That the Secretary be requested to notify the Fire and Police Department of the time of the holding of the next meeting of this Board, so that they can have representatives present to hear the report of the Engineer and the Electrical Expert which will then be read, upon the question of allowance by the Consolidated Telegraph and Electrical Subway Company to those Departments of space in the subways.

Was unanimously adopted.

An application of the United States Illuminating Company, made at the request of the Brooklyn Fire Insurance Company, to replace pole located opposite the latter's premises, on Liberty street east of Nassau street, to a point on the same lot 20 feet east from where the pole now stands, was granted, providing, however, that the consent of the property-owner be first obtained.

Adjourned subject to the call of the Chair.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, June 18th, 1890, at 12 o'clock M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

The following applications were referred to Expert Wheeler for his report:

An application of the Western Union Telegraph Company, dated June 17, 1890, to renew four wires on poles on the east side of West street, from Battery Place to Christopher street.

An application of the North New York Lighting Company "to erect the necessary poles and wires on Third avenue and 138th street, to connect its station with its existing lines."

An application of the Aqueduct Commission, dated May 27, 1890, to string wires for telephone service, from Aqueduct Gate House, 135th street and Convent avenue, to High Bridge, along Tenth avenue.

Five applications of the Gold and Stock Telegraph Company, dated respectively June 3, 12, 12, 13, 13, 1890, were, on motion of Commissioner Hess, laid over.

Mayor Grant offered the following resolution:

Resolved, That the application of the Postal Telegraph Cable Company, dated May 27, 1890, to run a wire from the corner of 39th street, west side, to east side of Tenth avenue, then across to west side of Tenth avenue to 42d street, be denied.

Unanimously adopted.

The Board considered an application of the Metropolitan Telephone and Telegraph Company, dated June 4, 1890, to place aerial cables over and across Sixth avenue, between 38th and 39th street, temporarily.

Expert Wheeler stated that he had investigated the matter of the application very carefully, that the permission sought was necessary to the Company's business, and that he reported favorably to the granting of the application.

Mayor Grant (to President Cutler, of the Metropolitan Company): You will have it down in 60 days?

Mr. Cutler: Yes, sir.

Mayor Grant hereupon offered the following resolution:

Resolved, That a permit issue to the Metropolitan Telephone and Telegraph Company to place aerial cables over and across Sixth avenue, between 38th and 39th street, on condition, however, that the Company remove the same within sixty days after their erection.

Unanimously adopted.

The applications before the Board of the Metropolitan Telephone and Telegraph Company for individual telephone connections, reported by Dr. Wheeler as being in localities in which there are no subways, were, on motion of Mayor Grant, granted.

The Board took up and considered the following application of the Consolidated Telegraph and Electrical Subway Company:

NEW YORK, June 13, 1890.

TO the Honorable, the Commissioners of the Board of Electrical Control, Hon. HUGH J. GRANT, President, 1266 Broadway, New York, N. Y.:

GENTLEMEN:—We beg to submit herewith, for your approval and authorization, the following lines of electrical subways, to be constructed during the present season, and for which we ask your favorable consideration:

1. Franklin street, north side, from West Broadway to Centre street.
2. Elm street, west side, from Worth street to proposed manhole at northwest corner of Franklin street.

These lines are desired for the accommodation of the telephone and telegraph companies which have made application for subway facilities on those streets, and the construction will consist of wrought iron pipe laid in hydraulic cement concrete.

Maps showing the location of the above lines are filed herewith.

Very truly yours,

E. L. RIDGWAY, V. P. & G. M.

Recommended.

H. S. KEARNY, Engineer.

Mayor Grant moved the following resolution :

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized, directed and ordered to construct, during the present season, subways for telephone and telegraph service, in Franklin street, north side, from West Broadway to Centre street, and in Elm street, west side, from Worth street to proposed manhole at northwest corner of Franklin street—construction to consist of wrought iron pipe laid in hydraulic cement concrete.

Unanimously adopted.

The following other application of the Consolidated Telegraph and Electrical Subway Company was read and considered :

NEW YORK, June 17, 1890.

To the Honorable, the Commissioners of the Board of Electrical Control, HON. HUGH J. GRANT, President, 1266 Broadway, New York, N. Y.:

GENTLEMEN :—We beg to submit herewith for your approval and authorization the following lines of electrical subways, for construction during the present season, and for which we ask your favorable consideration :

1. A telephone and telegraph subway, from manhole north side of 14th street at intersection of University Place to the east side of Fourth avenue, between 14th and 15th streets, thence north on the east side of Fourth avenue to 32d street, and east on the north side of 32d street to Lexington avenue.

2. A telephone and telegraph subway, on 86th street, from Lexington avenue to east side of Third avenue, north on the east side of Third avenue to 90th street, across Third avenue at 90th street to the west side, thence north to 106th street, across the avenue to the east side, and thence north on that side to 130th street.

These lines are needed for the accommodation of the electrical companies applying for facilities in the above localities, and the construction will consist of wrought iron pipe laid in hydraulic cement concrete.

Maps showing location of above lines are submitted herewith.

Very truly yours,

THEO. N. VAIL, President.

Approved.

H. S. KEARNY, Engineer.

Mayor Grant offered the following resolution :

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized, directed and ordered to construct, during the present season, lines of electrical subways—construction to consist of wrought iron pipe laid in hydraulic cement concrete—as follows :

1. A telephone and telegraph subway, from manhole north side of 14th street at intersection of University Place to the east side of Fourth avenue, between 14th and 15th streets, thence north on the east side of Fourth avenue to 32d street, and east on the north side of 32d street to Lexington avenue.

2. A telephone and telegraph subway, on 86th street, from Lexington avenue to east side of Third avenue, north on the east side of Third avenue to 90th street, across Third avenue to 90th street to the west side, thence north to 106th street, across the avenue to the east side, and thence north on that side to 130th street.

Unanimously adopted.

The following communication from the United Electric Light and Power Company was read:

NEW YORK, June 9, 1890.

HON. THEO. MOSS, Sec. of the Board of Electrical Control, 1266 Broadway, City:

DEAR SIR:—A letter signed by F. E. Brown, Clerk of Electrical Conductors attached to your Board, which letter is dated June 5th, and is addressed to the Brush & U. S. Illuminating Co's, has been received.

It states that the writer has been directed by Dr. S. S. Wheeler to ask when the Brush & United States Co's are going to remove their wires in the following streets:

23d St., from B'way to 4th Ave.,
23d St., from 6th Ave. to 11th Ave.,
29th street, from 3d to 1st Aves.,
42d street, from B'way to 3d Ave.,
59th St., from 1st to 8th Aves.,
7th Ave., from 46th to 59th streets.

To that letter we beg to reply as follows:

The letter above referred to states that "This is a list of streets mentioned in the 90 days' notice dated Jan. 8th, 1890, and from which you said you would remove your overhead wires."

The above list is slightly inaccurate. You will probably recall the conversation between the undersigned and the members of your Board as to the condition of 23d street, from Broadway to Fourth avenue, from which it appeared subway accommodation had not been provided in that portion of 23d street to permit of the removal of electric light and power wires. Neither is this street mentioned in the resolution in reference to this matter adopted at your meeting of May 14th.

As to 29th street, between 3d and 1st avenues, we beg to state, as we did at that meeting, that there are no wires or poles belonging to either of these Companies on that street between those points.

In reference to the wires on 23d street, between 6th avenue and 11th Ave., and on 42d street, from B'way to 3d Ave., on 59th St., from 1st to 8th avenues, on 7th Ave., from 46th St., to 59th St., we beg to say that all wires belonging to either the Brush Illuminating Co. or the U. S. Illuminating Co., other than those which are required for the city street lights, have been removed, and concerning the wires used for the city

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street lights on the streets and avenues mentioned, we beg to say that we have reported to His Honor the Mayor, verbally, that we have not removed these, and will not do so until such time as the Board of Electrical Control or the Gas Commission or His Honor the Mayor informs us that they prefer not to have the street lights burned; but that they prefer the removal of the single wires and few poles necessary to supply those lights.

Trusting that your Board will consider the existence of these wires, under the circumstances as in no way violating the promises we made to your Board, we remain,

Yours very truly,

UNITED ELECTRIC LIGHT & POWER CO.,

By WM. H. BROWNE, Treas. & Mgr.

The Board discussed the communication of the Electric Light and Power Company, hearing and questioning Mr. Browne, its Manager, at considerable length in respect to the subject matter, also hearing Dr. Wheeler, and,

On motion of Mayor Grant, directed Dr. Wheeler to confer with Mr. Browne, and report at the next meeting.

Mayor Grant, after some preliminary discussion, and hearing Commissioner Gilroy, Engineer Kearny, and Mr. Cohen, of the Construction Company, moved the following resolution:

Resolved, That this Board revoke all of its authorizations and directions heretofore given to the Consolidated Telegraph and Electrical Subway Company to construct subways, in respect to those streets and portions of streets which have already been repaved, as per list to be furnished by Commissioner Gilroy to the Secretary of the Board not later than June 19th inst.

Unanimously adopted.

The following report of Engineer Kearny was read:

NEW YORK, June 18th, 1890.

To the Honorable, The Commissioners of the Board of Electrical Control:

GENTLEMEN:—In compliance with resolution of the Board of Electrical Control adopted at its last meeting, May 19th, 1890, I have to report that we are now constructing subways for electric light purposes as nearly as possible in conformity with the request of the Board contained in this resolution, "so as not to cause the continual tearing up of the streets after they have been repaved." We are constructing our electric light subways as close as possible to the curb line, and putting in hand-holes for house connections approximately 50 feet apart on the line of subway, bringing the covers of the hand-holes to the surface of the street—thus allowing access to the hand-holes without disturbing the pavement.

The construction of subways is progressing on Lexington avenue, Eighth avenue and Madison avenue, as well as in numerous streets in the lower part of

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the city, and effort is being made to complete our work before the Commissioner of Public Works repaves the streets.

Very respectfully,

HENRY S. KEARNY, Engineer to the Board.

Engineer Kearny and Expert Wheeler submitted to the Board the following report:

NEW YORK, May 19, 1890.

To the Honorable, The Commissioners of the Board of Electrical Control:

GENTLEMEN:—Having examined the correspondence of Fire and Police Departments with the Consolidated Telegraph and Electrical Subway Company, for their respective Departments, we are of the opinion that wherever there is unoccupied space in a duct in subways assigned to the use of the City Departments, there is no mechanical or electrical objection to both Departments occupying the same duct. The only objection seems to be a mechanical difficulty of removing or replacing a cable, but that difficulty has been overcome by the Fire Department placing several cables in the same duct for its service.

Very respectfully,

H. S. KEARNY, Engineer,

S. S. WHEELER, Elect. Expert,

Committee.

The Board discussed and considered the report of Engineer Kearny and Expert Wheeler, and the matter embraced therein, hearing Vice-President Ridgway, on behalf of the Consolidated Telegraph and Electrical Subway Company, also Mr. Cohen, of Counsel for that Company, Police Commissioner Voorhis, on behalf of the Police Department, and others—

Commissioner Hess offering the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be directed to assign for the combined use of the Fire and Police Departments one $2\frac{1}{2}$ -inch duct, wherever subways have been built and their service requires it, until such time as it shall be apparent that the duct assigned will not be sufficient space necessary for the accommodation of their business.

Which was unanimously adopted.

Mayor Grant called for information as to the present state of subway construction, and, in response to his request,

Mr. Cohen read the following report of the Construction Company's Engineer to its President:

NEW YORK, June 12, 1890.

MR. THEODORE N. VAIL, President,

18 Cortlandt street, New York, N. Y.:

DEAR SIR:—In accordance with your telephone message of this date, requesting information as to the number of openings for new construction at the present time, I desire to state that they are as follows:

1. Lexington avenue, each side, 79th to 86th streets, telephone and telegraph subway and electric light subway.
2. Lexington avenue, east side, 42d to 59th streets, telephone and telegraph and electric light subways.
3. Madison avenue, east side, 42d to 59th streets, electric light and Edison subways.
4. 59th street, south side, Madison to 6th avenues, electric light subway and Edison on both sides of the street.
5. 8th avenue, west side, 18th to 38th street, telephone and telegraph and electric light subways, with Edison on both sides of the street. On the west side, from 13th to 18th streets, there has already been constructed an electric light subway during the present season. On the east side, from 13th street north, we are building an electric light subway.
6. Broadway, west side, south of 14th street, electric light and Edison.
7. Canal street, both sides, Bowery to Hudson street, electric light and Edison subways.
8. Greenwich street, east side, Canal to Fulton streets, electric light subway. The construction of this line began this date.
9. Reade street, south side, Broadway to Centre street, electric light subway, with Edison on both sides of the street.
10. William street, east side, Wall to Frankfort streets, electric light subway, with Edison on both sides of the street. This line will be completed to Frankfort street, weather permitting, in a very few days.
11. South William street, east side, Broad to William streets, electric light and Edison subways. This line is nearly completed, and upon its completion it is proposed to transfer the gangs from William street to build an electric light subway on Pearl street, east side, Fulton to Oak streets.

The following subways have been completed during the present season:

1. Leonard street, south side, Broadway to Hudson street, electric light subway, with Edison on both sides of the street.
2. Broad street, west side, Exchange place to Pearl street, electric light subway, with Edison on both sides of the street.
3. Exchange place, south side, Hanover to William streets, electric light and Edison subways.

4. Hanover street, south side, Exchange place to Pearl street, electric light and Edison subways.

5. Whitehall street, east side, Beaver to South streets, electric light subway, with Edison on both sides of the street.

6. 18th street, south side, 7th to 8th avenues, telephone and telegraph and Edison subways.

7. Horatio street, north side, Greenwich avenue to 4th street, electric light subway.

8. Greenwich avenue, east side, 8th avenue to West 13th street, electric light subway.

We have employed on the openings above noted 980 men covering all classes, and in addition to these we have 63 men at work on the construction of subsidiary connections for the different electrical companies, and 56 employed to repave over the subway that were constructed during 1889 and the past winter.

We have open for the accommodation of the Edison Electric Illuminating Company special trench as follows:

1. 49th street, both sides, Madison to 6th avenues.

I am informed that subways in the following streets have been completed for the Edison Company:

1. Beaver street, both sides, Broadway to Pearl street.
2. Murray street, both sides, Broadway to College place.
3. 40th street, both sides, Madison to 6th avenues.
4. 47th street, south side, Madison to 6th avenues.

There are employed on behalf of the Edison Company about 175 men, which together with those above noted makes the total number of men employed on the subway construction at this time 1,274.

Trusting that the above will fully meet with your requirements, I am,

Very truly yours,

LEONARD F. BECKWITH, Chief Engineer.

Mayor Grant offered the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be requested to make a report to this Board at its next meeting of the actual subway construction performed by it, giving the streets in which the work has been completed, and those in which it has commenced, with a statement of the progress of the work in the latter.

Unanimously adopted.

Adjourned sine die.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday, August 22d, 1890, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant offered the following resolution:

Resolved, That the applications of the Metropolitan Telephone and Telegraph Company now before the Board, and reported favorably upon by Expert Wheeler, for permission to string wires in districts where there are no subways for individual telephone connections, be granted.

Unanimously adopted.

The following communication of the Metropolitan Telephone and Telegraph Company was read:

NEW YORK, August 22d, 1890.

To the Honorable the Board of Electrical Control:

GENTLEMEN:—The Metropolitan Telephone & Telegraph Company respectfully requests authority to erect a line of poles and wires for the accommodation of its Long-Distance service, along Eleventh avenue, from West 11th to West 59th streets.

Very respectfully yours,

THE METROPOLITAN TELEPHONE & TELEGRAPH COMPANY,

CHAS. F. CUTLER, President.

The Board, after some discussion of the communication of the Metropolitan Telephone and Telegraph Company, and hearing President Cutler, on motion of Mayor Grant, adopted the following resolution:

Resolved, That the Metropolitan Telephone & Telegraph Company be authorized to erect a line of poles and wires, for the accommodation of its Long-Distance service, on Eleventh avenue from West 11th street to West 73d street; they agreeing to furnish facilities upon said line for the accommodation of such wires of the Fire Department of the City of New York, and of other telegraph companies, as are now in use upon other lines of poles on the same street, and also the wires of the Fire Department now in use on Tenth avenue between 11th and 73d street; the Metropolitan Telephone and Telegraph Company also agreeing, upon the completion of the above line, to remove the one on 39th street from Eleventh avenue to Seventh avenue, along Seventh avenue to 56th street, and on 56th street from Seventh avenue to Eleventh avenue; also, to remove all the poles and wires belonging to it which are replaced by the new construction authorized by this resolution.

Unanimously adopted.

Mayor Grant offered the following resolution:

Resolved, That the Fire Department be notified that the Board of Electrical Control has authorized the erection by the Metropolitan Telephone and Telegraph Company of a new line of poles on Eleventh avenue from 11th street to 73d street, providing for space for the wires of the Fire Department thereon, and that the Department may transfer its wires from their present position to such new pole line.

Unanimously adopted.

The following communication of the Consolidated Telegraph and Electrical Subway Company was read:

NEW YORK, August 22d, 1890.

To the Honorable, The Commissioners of the Board of Electrical Control, HON. HUGH J. GRANT, President, 1266 Broadway, New York:

GENTLEMEN:—We beg to submit herewith, for your approval and authorization, lines of electrical subways for construction during the present summer, and for which we ask your favorable consideration.

43d street, north side, Fifth to Sixth avenue,
Fifth avenue, both sides, Waverly place to 59th street,
Pearl street, both sides, Oak street to Broadway,
Pearl street, both sides, Whitehall to Wall street,
Stone street, both sides, Whitehall to Broad street,
Exchange place, south side, Broadway to New street,
New street, east side, Marketfield St. to Exchange Pl.,
William street, both sides, Beaver street to Old Slip,
North William street, both sides, Franklin St. to Park Row,
Duane street, both sides, Park Row to Centre street,
Elm street, both sides, Reade to Pearl street,
Centre street, both sides, Reade to Canal street,
Park street, east side, Duane to Worth street,
Worth street, south side, Park street to Chatham Sq.,
Old Slip, both sides, William to South street,
Water street, both sides, Old Slip to Wall street,
Front street, both sides, Old Slip to Wall street,
South street, west side, Old Slip to Wall street,
South street, west side, DePeyster street to Burling Slip.

The construction of all these lines will consist of the special tubing of the Edison Electric Illuminating Company, and the lines are desired for the special accommodation of that Company.

The lines checked in red in the foregoing list were submitted to your Board on map filed May 7th, 1890.

Very truly yours,

THEODORE N. VAIL, President.

The Board considered the application of the Consolidated Telegraph and Electrical Subway Company, and heard statements from Mr. Lauterbach, representing the Company, and from representatives of the various Electric Light Companies, expressing their desire for subway accommodation in the localities mentioned in the application, and, on motion of Mayor Grant, laid it over to the next meeting.

A statement submitted by the Consolidated Telegraph and Electrical Subway Company showing amount of subway construction performed by it during the present season was ordered to be placed on file.

Commissioner Moss offered the following resolution:

Resolved, That the usual ninety days' notice be given to the owners or operators of the electrical conductors above ground for electric light and power service in Broadway between 14th street and Houston street.

Unanimously adopted.

Mayor Grant directed the Consolidated Telegraph and Electrical Subway Company to furnish to the Board a statement of the subsidiary subway construction performed by it, exclusive of house connections.

Mayor Grant stated that there was an application to light the East River Park, and moved the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized and directed to build a subway for electric light service, in 84th, 85th or 86th street from Third avenue to the East River Park.

Unanimously adopted.

Expert Wheeler made the following report:

NEW YORK, July 10th, 1890.

The Honorable Commissioners of the Board of Electrical Control:

GENTLEMEN:—I have to report upon wires of the United States Co. in streets where there are subways, referred to me at the last meeting, as follows:

This Company have in

Houston st. from Broadway to First ave., 2 wires;
23d st. from 6th to 10th ave., 1 wire; 10th to 11th, 2 wires;
42d st. from Broadway to Fifth avenue, 1 wire;
59th st. from First to Eighth avenue, 1 wire;
7th ave. from 58th to 55th sts., 2 wires; 55th to 45th, 1 wire.

In each of these streets there is a subway for this class of conductors, notice of the completion of which has been served over 90 days ago. It has been our practice to request the removal of wires in such cases.

In 23d street east of Broadway there is also one wire for which it is claimed there is no room in the subway.

Very resp'y,

S. S. WHEELER.

Mayor Grant offered the following resolution:

Resolved, That, in case the United States Illuminating Company and the Brush Electric Illuminating Company have not their wires in the subways in the following streets:

Houston street from Bowery to First avenue,
23d street from Sixth to Eleventh avenue,
42d street from Broadway to Fifth avenue,
59th street from First to Eighth avenue,
Seventh avenue from 58th to 45th street,

in thirty days, the Secretary be directed, on the expiration of the thirty days, without further order, to so inform the Mayor, when an order will be given by him to the Commissioner of Public Works for the removal of their overhead construction in such streets.

Unanimously adopted.

Engineer Kearny stated, in reference to the matter of subway rentals referred to him, that he had proceeded to take testimony, but had suspended the investigation at the instance of the Companies until such time as they desired to continue it.

Judge Kelly stated that the East River Electric Light Company had written a letter asking Engineer Kearny to proceed with the investigation.

The Board hereupon, on motion of Commissioner Moss, adjourned sine die.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, August 28th, 1890, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant: Here is a letter from the Mount Morris Electric Light Company claiming the right to build subways in the same streets as applied for by the Consolidated Telegraph and Electrical Subway Company on behalf of the Edison Electric Illuminating Company. In connection therewith and the subject that was discussed at the last meeting I desire to offer the following resolution:

The Consolidated Telegraph and Electrical Subway Company having by an application dated August 22d, 1890, submitted for the approval and authorization of this Board the propriety of constructing lines of electrical subways on the following streets, avenues and places:

43d street, north side, Fifth to Sixth avenue,
 Fifth avenue, both sides, Waverly place to 59th street,
 Pearl street, both sides, Oak street to Broadway,
 Pearl street, both sides, Whitehall to Wall street,
 Stone street, both sides, Whitehall to Broad street,
 Exchange place, south side, Broadway to New street,
 New street, east side, Marketfield st. to Exchange pl.
 William street, both sides, Beaver st. to Old Slip.
 North William street, both sides, Franklin st. to Park Row,
 Duane street, both sides, Park Row to Centre street,
 Elm street, both sides, Reade to Pearl street,
 Centre street, both sides, Reade to Canal street,
 Park street, west side, Duane to Worth street,
 Worth street, south side, Park street to Chatham sq.,
 Old Slip, both sides, William to South street,
 Water street, both sides, Old Slip to Wall street,
 Front street, both sides, Old Slip to Wall street,
 South street, west side, Old Slip to Wall street,
 South street, west side, DePeyster St. to Burling Slip,

Resolved, That the said application be approved, and that the said Consolidated Telegraph and Electrical Subway Company be authorized, empowered and directed to construct subways in the said streets, avenues and places; the construction of these lines to consist of the special tubing of the Edison Electric Illuminating Company, and of such other ducts, for the use of other electric lighting companies, as shall be designated and directed by the Engineer of this Board for such Companies as shall apply on or before September 4th, 1890, for such ducts and as shall have complied with the requirements of this Board covering such applications; subject to the approval of the Commissioner of Public Works.

Unanimously adopted.

The Board discussed the foregoing resolution, which was finally unanimously adopted, and pending its consideration the following communication of the United Electric Light and Power Company was read:

NEW YORK, August 28th, 1890.

HON. HUGH J. GRANT, Mayor, etc., and Chairman of the Board of Electrical Control:

DEAR SIR:—At the meeting of the Board of Electrical Control, held on Friday, August 22d, 1890, there was submitted a letter from the Consolidated Telegraph and

Electrical Subway Company requesting the Board to authorize the construction of subways in certain streets, specifically mentioned in the letter. The letter also stated that "all these lines will consist of the special tubing of the Edison Electric Illuminating Company, and the lines are desired for the special accommodation of that Company."

As that letter contained no recommendation for other subways than those specially designed for the Edison Company, the undersigned desires to call the attention of the Board to the fact that its applications for subways heretofore made, including those subways submitted herewith, cover all, or substantially all, of the streets above referred to, and we therefore request your Honorable Board that, in case you order to be constructed any of the special Edison subways referred to in the above letter, you at the same time order that subways be simultaneously constructed in those streets for our use.

In this connection we wish to state generally, that while we have voluntarily given to the Consolidated Telegraph and Electrical Subway Company a bond in the sum of \$100,000 as security for the payment of rentals, we do not concede the right of that Company or of the Board of Electrical Control to exact such a bond. Our position is, that under the law the Board of Electrical Control is obliged to furnish equal subway facilities to all companies engaged in distributing electric light and power in New York City, and therefore that it cannot lawfully authorize the construction of a special duct for the Edison Company in any street or locality, without at the same time authorizing the construction of a general electric light subway in the same street or locality. It is certainly to the interest of the city and the public that nothing should be done which will tend to give one electric light company a monopoly of the business in a particular locality, and that when a street is opened for any subway construction sufficient accommodation should be provided to meet the wants of the electric lighting industry for a reasonable time to come.

Very respectfully yours,

THE UNITED ELECTRIC LIGHT & POWER CO.,

By C. H. JACKSON, President.

Mayor Grant: I am informed by the Secretary of this Board that there are companies, such as the Holmes Burglar Alarm Company, American District Telegraph Company, Mutual District Messenger Company, Ticker Companies, Protective Associations, stringing wires without permits of the Board, and paying no attention to its rules and regulations; and I move:

Resolved, That the Secretary be directed to procure from the Electrical Expert and the Engineer, and from such other officials of the Board as he may deem desirable, a list of such companies or persons as have wires strung, and lamp or other connections, in the city, without permits of the Board, or in violation of law or the rules of the Board, and that any such companies and persons be notified that a hearing will be given them at the next meeting of the Board to show cause why their wires and lamp and other connections so strung and erected should not be removed.

Unanimously adopted.

Mr. Gilroy (Commissioner of Public Works): Here are a number of directions from the Board of Electrical Control to remove certain wires and lights alleged to have been hung in violation of the rules of this Board. The East River Electric Light Company, to which corporation most of these wires and lights belong, declare those wires and lights were not hung in violation of the rules of the Board. After having cut down two or three of those mentioned there, I have desisted from further cutting. The East River Company has also sent to my Department a bill for damages and a notice that a bill for other damages will be presented, and I ask now that the Department receive further instructions in regard to it.

Mayor Grant: I move:

Resolved, That all further cutting of wires under referred to above notices from the Board to the Bureau of Incumbrances alleging them to have been strung without a permit be suspended.

Unanimously adopted.

Mayor Grant: I presume these wires have been reconnected, and I shall, so as to get this matter properly before the Board, move:

Resolved, That the Secretary be directed to report at the next meeting the condition of the wires of the East River Electric Light Company referred to in the statement of Commissioner Gilroy as having been cut by the Bureau of Incumbrances of his Department, at the time of their cutting, and all facts pertaining to their alleged unlawful existence in the streets.

Unanimously adopted.

Commissioner Gilroy: These (referring to papers in his hands) are applications for subsidiary ducts by the Phoenix Construction Company, for the purpose of making connections with their mains. The question was brought up before at a meeting of this Board nearly a year ago as to what constituted a subsidiary duct, and there was no definite construction of that question. Subsidiary ducts are lines sometimes 25 feet long, sometimes 2,500 feet long. I ask that some definite instructions be given.

Mayor Grant thereupon offered the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be directed to hereafter make application to the Board, for its approval and authorization, for any proposed subsidiary subway construction, exclusive of house connections.

Which was unanimously adopted.

Engineer Kearny stated that he submitted applications of the various Electric Light Companies, and of the Consolidated Telegraph and Electrical Subway Com-

pany, for authorization of subways in certain streets and avenues; some had been in his hands for weeks, and some had come to him very recently.

And the Board, on motion of Mayor Grant, referred these applications to Engineer Kearny, except that part of them referring to

Greenwich street from Fulton to Vesey street,
Greenwich street from Canal to Vandam street,

Mayor Grant moving a resolution, and the Board adopting it, in respect to those localities, as follows:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized and directed to construct during the present season subways for electric light and power service in the following streets:

Greenwich street from Fulton to Vesey street,
Greenwich street from Canal to Vandam street.

Unanimously adopted.

Engineer Kearny made the following verbal report:

The request of the East River Electric Light Company for a reduction of rent was referred to me. I have had two hearings; the first was held April 2d, and was adjourned at the request of two or three of the Companies. At the last meeting of the Board I was requested to continue the reference, and I have done so, holding a hearing August the 26th, and I have the testimony of the two sessions here. The unanimous feeling among the Electric Light Companies, with the exception of the East River Company, was that the time for preparation of their cases was too short, and they asked for an adjournment of from one to two weeks; so that I would recommend that the Board allow me to give the Companies until the next meeting to put in whatever testimony they desire to offer.

The Board, on motion of Mayor Grant, adopted the following resolution:

Resolved, That the Electric Light Companies have one week to put in testimony to Mr. Kearny, and that he be directed to report to this Board at its next meeting.

Unanimously adopted.

Commissioner Hess offered the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized and directed to construct a subway for electric light and power in 58th street between Lexington avenue and Madison avenue during the present season.

Unanimously adopted.

Adjourned sine die.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday, September 19th, 1890, at 11 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant: After consultation with the other members of the Board, it has been decided not to take up at this meeting the subject of wires put up without permits, and the matter will go over to the next meeting of the Board to be held on Tuesday next at 11 o'clock A. M.

Commissioner Hess suggested that the Board first consider the report of Expert Wheeler in connection with the killing of Kopp at 35th street and Broadway, and with the injury to the boy Young in Pearl street; and

His report, as follows, was thereupon read:

NEW YORK, September 18, 1890.

HON. HUGH J. GRANT, Mayor, and President of the Board of Electrical Control:

SIR:—According to your letter of the 16th instant directing me to report upon the accidents by wires at Broadway and 35th street, and at Pearl street and Maiden lane, as to the facts, responsibility, etc., I have to report as follows:

The lineman George Kopp in the discharge of his duties found that the lamp at Broadway and 35th street was not working properly, and having probably decided that it was grounded and the current leaking to earth at this point, he ascended the pole to disconnect the line entirely from the lamp, so as to free the line of the leak. He cut the insulation from the wires, and connected them together by a short conductor covered with rubber tubing, especially made for that purpose, so that the wires could be disconnected from the lamp without interrupting the rest of the circuit. After disconnecting them entirely from the lamp, he touched the wire and was killed.

The accident was unquestionably due to the gross carelessness of the man, who not only violated the rules of the Board but the rules of his Company. Our rule—No. 30—requires that every lineman must wear rubber gloves, and so do the rules of the Company. The man is said to have been an exceptionally careful lineman, and has been known on many occasions to return to the station for his gloves after having gone a considerable distance. On this occasion he did not have them with him.

Some attention has been called to the fact that he had completed the removal of insulation from the main wire to connect the splicing wire or jumper and had disconnected the line from the lamp entirely, which probably involved his touching the bare wire in removing its insulation, before he received the shock. This is undoubtedly due to the fact that there was a leakage passing down the lamp as long as it was connected to the line, which prevented the said leakage from passing through the man, and that when the lamp was disconnected the current passed through him the next time he touched the wire. That he did again touch the wire is proved by the statement of eye-witnesses who saw him put his hand up to the wire

after the lamp was out, who also stated that the hand had to be forced off the wire with a club. The lamp-post was of iron, which furnished the escape from his legs to earth.

As the use of his rubber gloves would have effectually prevented the accident no blame can be laid except to the man. He was provided with gloves by the Company, and had marked his name and address on the inside of the same, but had left them behind.

In this connection, I would suggest that a rule be adopted requiring companies to furnish their trouble-hunters, and all men when working on live wires, with no other but insulated plyers and tools so made that the insulation cannot be removed without destroying the tool.

In reference to the accident to Charles B. Young, in Pearl street near Maiden lane, I find the facts are as follows:

An iron housetop telegraph wire had fallen to the street shortly before Young's arrival. The end was dragged along a short distance by a passing cab. As Young came up, the wire was caught by a locomotive on the Elevated Road, causing the lower end to snap around Young's body, lifting him two or three feet from the sidewalk, tearing his coat and throwing him into the street. The boy of course was dazed, and imagined he received a shock. He has a slight scratch on one ear, which does not look like a burn, and none of the eye-witnesses saw any spark. There is no electric light line near this place. The remains of the wire have been removed, and there are no traces showing whom it belongs to. It was probably a District Messenger wire. The Board is doing all in its power to secure the removal of all these housetop and wild cat wires.

Very respectfully submitted,

SCHUYLER S. WHEELER, Electrical Expert to the Board.

Expert Wheeler stated, in answer to interrogatories put by Mayor Grant during the reading of the former's report, that there must have been two grounds on the wire that killed Kopp—one at the lamp, and the other at some other point of the circuit; companies can have indicators at their stations to show a ground; and the rules of the Board require that when a ground comes on, the company must try to remove it, and failing must stop the circuit.

And the Board, after consideration of the report, on motion of Mayor Grant, adopted the following resolution:

Resolved, That the report of the Electrical Expert, relating to the accident to the boy Charles B. Young, be accepted; and that the report relating to the death of George Kopp be referred back to the Expert, to ascertain whether the company operating the circuit which killed Kopp knew of the ground, and knowing it, allowed him to make the repairs; and to report the facts at the next meeting.

Unanimously adopted.

Mayor Grant: We will now take up the report of Mr. Kearny in relation to rentals.

The report of Mr. Kearny, as follows, was read:

1266 BROADWAY,

NEW YORK, Sept. 15th, 1890.

To the Hon., The Board of Electrical Control:

GENTLEMEN:—In conformity with the following resolution passed March 26th, 1890, viz.:

"Resolved, That the communication of the East River Electric Light Company, dated March 24th, 1890, protesting against the rates of rental charged for the use of ducts for electric light conductors, be referred to the Engineer of the Board, to take testimony in respect thereto, and report the same to the Board."

I have the honor to report that in response to my invitation the following named Companies, viz.:

The East River Electric Light Co.,
The Brush Electric Illuminating Co.,
The United States Illuminating Co.,
The United Electric Light & Power Co.,
The Manhattan Electric Light Co.,
The Harlem Lighting Co.,

appeared before me on April 2d, and again on August 26th, last, and appended hereto are the records of the proceedings at those hearings, together with such data and communications as were then, and have since been presented:

SCHEDULE OF RENTALS.

The following is the present Schedule of Rentals charged by the Consolidated Telegraph and Electrical Subway Company filed with the Board:

For 4 inch ducts,	\$1,250	per mile per annum			
" 3 " "	\$1,000	" " " "			
" 2½ " "	850	" " " "			
" 2 " "	700	" " " "			
" 1½ " "	550	" " " "			
" 1¼ " "	500	" " " "			

For distribution ducts 1 to 4 inches, \$1,000 per annum.

According to this Schedule, the interior capacity of the duct mainly governs the amount of the rental, which is larger or smaller, as the size is greater or less.

The Telegraph and Telephone Companies and the Edison Electric Illuminating Company have not made any complaint in relation to the rentals, though they are largely occupying the ducts provided for their respective services.

The high tension electric light companies who appeared before me, and who appeal from the Schedule of Rentals, principally occupy ducts of three inches diameter and are charged rental of \$1,000 per mile per annum, which they claim is excessive.

The Consolidated Telegraph and Electrical Subway Company has filed with me a statement showing the following:

SUBWAYS CONSTRUCTED TO JANUARY 1, 1890.

For Telegraph and Telephone.....	501 miles
For Electric Light and Power.....	515 "

Total 1,016 "

Cost of construction and expenses during construction, including repairs, alterations, ventilation, maintenance, and interest on loans, 1886 to 1890 \$4,827,647

SUBWAYS OCCUPIED TO MAY, 1890.

Telegraph and Telephone.....	188 miles
Electric Light and Power.....	216 "

Total 404 "

producing at present rates an annual rental of \$388,771.

The annual expenditures of the Subway Company are stated to be 6% on bonds issued to cover cost

Of Construction	\$285,000.00
Depreciation, 5 per cent.....	241,382.00
Operating, expenses, taxes, ventilation and contingencies..	300,000.00
	<hr/>
	\$826,382.00

showing an annual deficit of \$437,611.

The claim that \$1,000 per mile per year for a three inch duct is an excessive rental was first formally advanced by the East River Electric Light Company, who in their letter of March 24th, 1890, state that they have been informed that "a three inch duct is rented and maintained in Philadelphia for \$250 per mile per year."

At the hearing on April 2d, the same Company offered as testimony the estimate of their Engineer, Mr. H. A. Foster, which states that a subway of 8 ducts (about the average in this city) costs \$3,748 per mile per duct.

The Manhattan Electric Light Co. in their letter of complaint claim that the cost of construction should not exceed \$3,000 per mile of duct, and that the rental should not exceed \$400 per mile per year.

These estimates would on the present construction and extent of occupancy result as follows:

EAST RIVER ESTIMATE:

Say, 1,016 miles at \$3,748, cost.....	\$3,807,968
Rental on 404 miles.....	388,771
Depreciation at 5%.....	\$190,405
Operating, expenses, taxes, etc.....	300,000
	<hr/>
Annual deficit.....	\$101,634

So that at present rates and extent of occupancy there would be a deficit of over \$100,000 per year, taking the cost of construction at the estimate given by the East River Co., and making no provision for any return on the \$3,808,000 invested.

The Manhattan Co.'s estimate show the following:

Say, 1,016 miles at \$3,000.....	\$3,048,000
Rental on 404 miles.....	\$388,771
Less depreciation at 5%.....	\$152,400
Operating expenses.....	300,000

\$452,400

Annual deficit..... \$63,629

and no provision for return on the investment.

Taking the estimated cost of construction given by the East River Company and the Manhattan Co., and also the annual rental, which they claim to be fair, it appears that on an expenditure of \$3,808,000 the East River Co.'s estimate (\$250 per mile) would bring a gross rental of \$254,000 if every duct was occupied its whole length all the year; and on the Manhattan Co.'s estimate an outlay of \$3,048,000 would bring a rental of \$406,400 if there was not an unoccupied spot in the whole 1,016 miles constructed at any time during the year.

That such figures are misleading is plainly seen when it is remembered that there must always be some portion of the subway unproductive of revenue and that even if such were not the case, the highest of the rentals mentioned and claimed by those companies to be reasonable would barely suffice to pay operating expenses and depreciation.

I have mentioned the details of the complaints of the East River Electric Light Co. and the Manhattan Electric Light Co. because they give figures, and base arguments upon them.

The other Companies, while joining in the appeal against the existing schedule of rentals, have not gone into details and therefore their communications do not call for any special comment.

The actual cost of construction was enhanced by reason of the extraordinary exigencies under which the work was prosecuted, and the difficulties, impossible to foresee in a new undertaking of this character, which were encountered.

With regard to the prospect of the Subway Company making an exorbitant profit at the present rentals, it appears that, without taking into consideration the interest on their bonded indebtedness (which appears to me to be a just charge) they are not, at the present extent of occupancy, making sufficient, at present rate of rentals, to pay operating expenses and allow for depreciation, nor, as I have shown, would they be, if the cost of construction were as low as the Electric Light Cos. claim it should be.

Assuming that the statement filed by the Subway Company is correct then even if the whole of the subways now constructed were occupied and the rentals asked for by the Subway Company were paid, estimating the average rental payable to be \$900 per mile per duct, the increase of receipts on the whole 1,016 miles of completed duct would be about \$525,129. As the present deficit is shown to be \$437,611 there would even then be an excess of receipts over operating expenses, depreciation and fixed charges of less than \$90,000.

Sept. 19th, 1890.

HENRY S. KEARNY, Engineer of Board.

Mayor Grant: You have heard the report; and I understand there are gentlemen here who wish to be heard on the subject, and the Board is ready to hear anything that the gentlemen wish to say.

Mr. Joseph H. Choate: I appear on behalf of the Brush and the United States Companies, and I would like to say a few words in their behalf with a view to an opportunity on the part of the Electrical Companies of meeting with the aid of the Board the statements of this report, and particularly the statement which purports to be a statement of the Subway Company upon which alone it appears to be based.

In the confirmation by the Board of these rentals which have already been proposed or fixed by the Subway Company, I think it is capable of demonstration that it will exclude from the subways the companies that I represent, and I believe all others except the Edison Electric Company, which has been permitted alone to build its own subways. So that it is a matter of life and death to them, and ought not to be determined immediately upon the presentation of this report.

Now, an official minute was very properly kept by Col. Kearny of the proceedings before him, and I suppose it is appended to this report as the facts, and I have had the opportunity of examining it this morning. It appears from those official minutes of the proceedings that Col. Kearny took the ground at the meetings which he held that he had no power to compel the taking of any testimony or compel the making of any statement; all that he could do there was to sit and take what came before him and report it to the Board; and I do not see that in that he was not entirely correct.

The companies that appeared protesting before him claimed that the Subway Company, claiming this enormous rent which would practically exclude them from the subways after they had been compelled to discontinue their overhead wires and go into the subways, had to make a statement which would bear and should be subjected to examination at his hands, at their hands, and at the hands of the Board, of the reasons that would justify the making of such a charge, and they professed to be ready to answer when such a statement should be furnished. Well, Mr. Ridgway, I believe it was, who appeared on the part of the Subway Company, said they would furnish such a statement while the matter was pending before Col. Kearny. But he did not do so. This statement which is referred to in this report was not so furnished. It was not furnished until after the closing, the formal closing of the matter before Col. Kearny. It was not so furnished until the time limited by him and by the Board for parties to be heard had expired; and it was only yesterday, so far as the companies I represent are concerned, that a copy of this statement of the Subway Company came into their hands. So while the proceedings were pending before him these companies had no opportunity to know what the statement was going to be of the Subway Company, as certainly in a matter of such vast and vital importance to them they have a right to; and I think if it had been presented, and

of the character such as Col. Kearny himself would have recommended, that the companies would have had an opportunity, with the aid of the Board, to analyze and verify it.

I am not speaking merely with a view to an adjournment, but with a view to some analysis and test of this statement which this Board alone can make, and I say that the Board cannot and ought not to be satisfied with a gross statement that the cost has been \$4,827,647, when under the statute organizing this Board and the Subway Company it is in the power of this Board to inspect the books, accounts and contracts of that Company and ascertain what the cost has been. Even the report made by Col. Kearny intimates that it covers a good deal more than the cost of construction. There are expenses referred to there, interest upon loans, etc., etc., included in this cost. Now, we are not prepared to believe or accept that this \$4,827,647 is the accurate and final statement of the cost of the thousand miles of subway that have been built—\$4,800 a mile; every citizen has seen this subway laid, and some general notion can be formed of the improbability of such a statement as that. These companies are entirely powerless to verify that statement; this Board can do it; this Board can ascertain where those \$4,827,647 came from and to what use it has been applied under the term cost, and we think it ought to be done in the interest of justice.

Mr. Choate still further criticised the figures of the Subway Company, answering many questions put by Mayor Grant, and continued his argument at much length.

Mr. Simon H. Stern and Mr. Frank Einstein appeared for the Manhattan Electric Light Company and the Harlem Lighting Company, and argued in favor of a reduction of the rentals.

Mr. Lauterbach appeared for the Subway Company, and made a lengthy and elaborate argument in its behalf in favor of the retention of the present scale of rentals, and answered the argument of Mr. Choate, who in turn replied to his argument.

Mr. Thomas F. Grady represented the East River Electric Light Company, and made a lengthy argument for it in support of its claim to a reduction of rental.

Mayor Grant stated that his purpose was to consult the Corporation Counsel on the subject of the contract and consider the arguments which had been offered, and that on Friday next a meeting of the Board would be held, at which the Board would decide either to go into an investigation, such as Mr. Choate had requested, or fix the rentals by some other means; in the meantime the companies ought to pay at least half of the accumulated rentals on the basis of the present charges, that the Subway Company might have no excuse for not building subways theretofore ordered to be constructed by the Board; and

The Board, on motion of Mayor Grant, passed the following resolution:

Resolved, That a meeting of the Board be held on Friday, September 26th, 1890, at 11 o'clock A. M., to dispose of the report of Engineer Kearny in respect to subway rentals, and the subject matter of such report.

Unanimously adopted.

Adjourned.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, October 23d, 1890, at 1 o'clock P. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The reading of the minutes of the last meeting was dispensed with.

The Board first considered applications of the Metropolitan Telephone and Telegraph Company for individual telephone connections.

Mayor Grant: You approve of them all?

Expert Wheeler: I do.

The following resolution was hereupon, on motion of Mayor Grant, passed:

Resolved, That permits issue to the Metropolitan Telephone and Telegraph Company upon its pending applications for overhead individual telephone connections approved by the Expert as being in districts where there are no subways.

Unanimously adopted.

Mayor Grant: I have a petition here from a large number of people in the 23d and 24th Wards asking for certain privileges for the North New York Lighting Company, which has applied to the Board to replace its circuits north of the Harlem River removed by the Bureau of Incumbrances for non-conformity with the rules and regulations of the Board. The people in those Wards are clamoring for electric light.

Engineer Kearny: At the present time it is impossible to make an intelligent estimate of the requirements of the service in that part of the city. I recommend that the application of the North New York Lighting Company be granted pending the construction of subways.

And the Board, after considering and discussing the matter, on motion of Mayor Grant, adopted the following resolution:

Resolved, That the Secretary issue a temporary permit to the North New York Lighting Company to replace and reconnect its circuits north of the Harlem River, which have been removed by the Bureau of Incumbrances, being at that time in violation of the rules and regulations of the Board—the construction of the same to be under the supervision of the Engineer and the Electrical Expert of the Board, and in accordance with the rules and regulations of the Board.

Unanimously adopted.

Engineer Kearny submitted original applications from the various electrical companies and from the Consolidated Telegraph and Electrical Subway Company for construction of subways and subsidiary connections, and from the last named Company for connections for ventilation of the subways, and recommended the granting of these applications.

And the Board, after considering the applications, and the recommendations of Engineer Kearny, on motion of Mayor Grant, adopted the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized, empowered and directed to construct subways in the following streets, avenues and places:

Subsidiary Connections:

8th Ave., M. H. 57th St., to 975 Eighth Ave.,
6th Ave., M. H. 10th St., to 133 Sixth Ave.,
Broadway, M. H. Exchange Pl., to 60 Broadway,
N. Chambers St., M. H. Park Row and Duane, to 486 N. Chambers,
10th Ave., M. H. 58th St., to 888 Tenth Ave., cor. 58th St.,
6th Ave., M. H. 26th St., to 427 Sixth Ave. (S. W. cor.),
West St., M. H. Cortlandt St., to building cor. Liberty St.,
Wooster St., M. H. Spring St., to 95 Wooster St.,
Broadway, M. H. 34th St. to N. W. cor. Broadway,
Park Row, M. H. Frankfort St., to "World" Building,
48th St., M. H. Lexington Ave., to 135 E. 48th St.,
56th St., from 6th Ave. to 124 W. 56th St.,
21st St., 6th Ave. to 57 W. 21st St.,
Broadway, east side, to west side, into 285 Broadway,
Broadway, east side, to west side, into 231 Broadway,
Seventh Ave., 123d to 125th St.,
So. Fifth Ave., Houston to 58 So. Fifth Ave.,
Bleecker St., south side, M. H. Broadway to 98 Bleecker St.,
Broad St., west side, Pearl St. to 108 Broad St.,
5th Ave., west side, junction box to rear of 46 Fifth Ave.,
Park avenue, 38th to 39th St.,
Crossing Park Row to James, along James to New Bowery,

Crossing Park Row at intersection of Catharine and Division streets to north side of Dover street,

Crossing W. Broadway at south side of Franklin St.,

Crossing W. Broadway at north side of Walker St.,

Crossing Greenwich St. at north side of Warren St.,

Crossing Greenwich St. at north side of Barclay St.,

Crossing Canal St., 10 feet east of Hudson St.,

Crossing Canal St., west side of Varick St.,

Crossing Canal St., east side of West Broadway,

Crossing Canal St., east side of Church St.,

Crossing Canal St., west side of Centre St.,

Crossing Canal St., west side of Elm St.,

Crossing B'way, N. E. cor. Vesey, to N. E. cor. of Ann St.,

5th Ave. crossing at 10th, 12th, 26th, 34th, 40th, 48th, 54th, 59th streets,

23d St., Broadway to Fifth avenue,

J. B. cor. Wall and Pearl streets to 106 Pearl St.,

Chambers St., both sides, Park Row to Centre street,

Broadway and 37th St., 100 feet west,

5th Ave. and 26th St. to 11 E. 26th St.,

5th Ave. and 43d St. to rear of 514 Fifth Ave.,

5th Ave. and 44th St. to rear of 528 Fifth Ave.,

Broadway and Cortlandt St. to 10 Cortlandt St.,

S. W. cor. 6th Ave. and 55th St. to 108 W. 55th St.,

From 129 to 130 Water St.,

125th St., Lexington Ave. west to connect with Telephone Exchange on corner,

32d St., from M. H. at intersection of Lexington Ave. into 132 E. 32d St.,

108th St., from M. H. at intersection of 3d Ave. into 201 E. 108th St.,

4th Ave., from M. H. at intersection of Macdougall St. into 132 W. 4th St.

Subways for Telephone and Telegraph:

124th St., north side, 3d to Lexington Ave.,

Lexington Ave., west side, 124th to 125th St.,

79th St., south side, 4th to 5th avenue.

Subways for Electric Light and Power:

7th Ave., east side, 58th to 59th St.,

37th St., south side, Park to 3d Ave.,

Centre St., east side, Reade St. to Park Row,

N. William St., Frankfort St. to Park Row,

Fulton St., north side, Broadway to William street.

Connections for Ventilating Pipe:

On the north side of 42d street, from manhole at intersection of Lexington avenue, to blower station at No. 145 East 42d street, to connect with subway on east side of Lexington avenue,

From the subway now in course of construction on the north side of 18th street, directly across the street, to blower station at No. 8 East 18th street, to connect with the 18th street subways,

On the south side of Cortlandt street, from manhole at intersection of Broadway, to a point opposite No. 18 Cortlandt street, thence directly across the street to blower station at No. 18 Cortlandt street, to connect with the subways on Broadway.

Unanimously adopted.

Adjourned sine die.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Thursday, December 4th, 1890, at 1 o'clock P. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant brought to the attention of the Board and had read the following communication:

NEW YORK, December 3d, 1890.

HONORABLE HUGH J. GRANT, Mayor, City of New York, City Hall, New York:

DEAR SIR:—We desire to call your attention to the fact that applications were made by this Company for subways on north side of Duane street, between Washington street and Centre street, also on Duane street, between Park Row and Centre streets, and said subways were authorized and ordered built by the Board of Electrical Control, work to be done by the Consolidated Telegraph and Electrical Subway Company.

Subways in said streets were provided for the Edison Company and none, contrary to your order, were provided for us.

Will you kindly dispose of the question and cause the subways, heretofore ordered, to be built.

Very respectfully,

THE MOUNT MORRIS ELECTRIC LIGHT CO.,

EDWARD MAY, President.

Commissioner Moss: I would like to know why subways were not provided for the Mount Morris Electric Light Company in those streets.

Mr. Lauterbach (representing Consolidated Telegraph and Electrical Subway Company): I have inquired into the matter from Mr. Ridgway. The Mount Morris Com-

pany at the time of the original application had not conformed, I think, fully to the requirements of the rules and regulations. Since then they have fully complied with them by the payment for all subsidiary ducts, and by the payment of all back rentals. The Mount Morris Company is the only one of the electric lighting companies that has absolutely met all the claims against it; but I think this was not so at the time when the work was originally ordered, and the rules and regulations had not been complied with in that respect. I think, however, it was not so much on that account that duct for the Mount Morris Company was not provided as on account of some oversight. Mr. Ridgway tells me the duct ought, and was intended to go in. It ought now to go in, if we can arrange to get it in before the 15th of the month, without doing any injury. I believe the application is entirely proper.

Mayor Grant: I do not think Mr. Gilroy will allow the street to be reopened; and it is a newly repaved street.

Mr. May (Pres. of Mount Morris Co.): Only one block.

Mr. Forster (of Counsel for Mount Morris Co.): Mr. Lauterbach has made a fair statement of the case, but his excuse is hardly proper. He says the Mount Morris Company was not in good standing when the application was made. That is not a proper excuse, for the reason that this Board ordered those subways to be built, and we, knowing that, did nothing further in the matter, relying on the good faith of the Subway Company to build them. They say we were not in good standing. That may be so. But it puts us in an awkward position—the streets are paved and we have no subways. I believe there is one block of subway to be built where the street is not paved. If the Subway Company will attend to that—

Mr. Lauterbach: We will agree to that.

Commissioner Hess: You might have been more vigilant yourselves.

Mr. Lauterbach: I think it was a matter of neglect.

Mayor Grant: They have been complying with the rules of the Board—at least from Mr. Lauterbach's statement—better than any other company. Cannot you put it under the sidewalk?

Mr. Lauterbach: We will do anything the Department permits us to do. Mr. Gilroy, there is an application made by the Mount Morris Electric Light Company for a subway duct in Duane street already ordered by the Board, but failed to be provided by the Subway Company, and one block of subway has been built and closed. Another block is about to be opened. In that block, of course, there will be no difficulty. If it is possible for us to rectify the error by putting in a conduit in that block, either under the sidewalk or laterally, the Company is willing to do it under such restrictions as the Department may indicate. In addition to that, is the fact that there are a number of other applications here for subsidiary connections, and the making of short connections here and there in order to perfect the system established in the district; and in respect to those we want to adhere as fully as possible to the rule you have established

that no more street openings shall take place except in emergent cases; and in those cases we will do the work as speedily as may be, under your direction and under the direction of the Engineer of the Department. In the Duane street case we will do anything you indicate.

Mr. Forster: We are agreeable to anything.

Mr. Gilroy: I can find no reason at all to depart from the rule I have named. I have afforded to all companies every reasonable and feasible opportunity of putting in whatever they wanted before the pavements were laid. Now that the pavements are laid, I will adhere to the rule except where property or life is in danger. The sidewalks I have nothing to do with.

Mayor Grant: I think they can put it under the sidewalk.

Mr. Gilroy: If I depart on one occasion from my rule the force of it will be broken, and I will not be able to resist the importunities in other cases.

Mr. Lauterbach: That would not apply to making subsidiary connections?

Mr. Gilroy: I cannot tell how it will apply. I mean it shall apply generally. If an application is made to me for a subsidiary connection that involves the digging up of a new pavement I will not give my consent. When these subways were built a system of hand-holes or boxes was adopted, that I thought would do away with the necessity of digging up the street, and I think it has done away with it to a great extent. If it is necessary to lay subsidiary connections it seems to me that there is no reason why the Department should be called upon to consent.

Mr. Forster: In this case we made our application early in the summer—August 27th—and the application was granted by this Honorable Board and the subways were ordered to be built, and we relied on the order of this Board. We ascertained one day that the street was being repaved, and then immediately applied to the Subway Company to have our subway built.

Mr. Gilroy: I desire to state that Duane street was one of the last streets repaved, and the repavement is not yet completed. In the case of that street, as I always do in such cases, I notified every company having anything to do with the street that this was their opportunity to do it. They did do something, and I supposed they did all that was necessary. I feel that I am perfectly correct in my position.

Commissioner Moss: One block has not been repaved.

Mr. Forster: We have a considerable amount of business in Duane street.

Mayor Grant: You can put it under the sidewalk.

Mr. Forster: We are willing to do anything that will help us out of this difficulty.

Mr. Browne (of the United Electric Light and Power Company): There has been something said here about companies not conforming to the rules and regulations of the Board.

Mayor Grant: I do not think we ought to take that up now. It may come up later in the argument.

Mr. Lauterbach: My statement was simply that the Consolidated Telegraph and Electrical Subway Company had no complaint to make against this Company.

Mr. Browne: The Company I represent made application to have a subway built in Duane street, and filed it with the Engineer of the Board.

Mayor Grant: You make the same sort of a complaint?

Mr. Browne: Yes, sir—that we made applications to the Board to have certain subways built. At the time that the resolution was passed ordering Edison subways there was considerable discussion between yourself and the other gentlemen of the Board, and Mr. Cravath, of Counsel for the Company, who is absent to-day, as to the purport of that resolution; and I think by reference to that meeting—the minutes of it—your own opinion and the opinion of your fellow Commissioners was that the subways for the other Companies would also be ordered. We have since been informed by the Engineer of the Board that we must conform to certain other requirements which are not apparently in the rules of the Board or upon its minutes definitely stated. We are called upon to file a bond for five years' rental instead of a bond for five years' occupancy, and on that account no subways have been built under our applications.

Mr. Lauterbach: I believe the order emanated from the Engineer of the Board for the construction of a duct for the Mount Morris Company, and for none other. We are guided by the directions of the Board. I do not think the question is material. If we get the street open again we can put in as many ducts as are applied for.

Mr. Browne: It applies to other streets besides Duane.

Commissioner Moss: Duane street is the only one that is before the Board now.

Mayor Grant: This question about your electric lights I think they will take care of.

The following resolution, on motion of Mayor Grant, was adopted:

Resolved, That the applications before the Board of the Metropolitan Telephone and Telegraph Company to string wires for individual telephone connections in localities where no subways are provided, approved by the Expert, be granted.

Unanimously adopted.

Commissioner Moss laid before the Board the following communication of Expert Wheeler and accompanying lists:

NEW YORK, December 4, 1890.

HON. THEO. MOSS, Sec'y, &c.:

SIR:—I have to report the following streets in which electric light subways have recently been completed, and where the overhead wires can be removed after 90 days' notice.

I have to report also the following list (Sheet B), which includes all electric light subways completed to date.

Very respectfully,

SCHUYLER S. WHEELER, Electrical Expert to the Board.

Subways Completed since last Ninety Days' Notice sent to Electric Light and Power Companies:

Park Row, Chatham Square to Brooklyn Bridge, 2 days,
 Whitehall street, Beaver street to South Ferry,
 Sixth avenue, 122d to 125th street,
 58th street, Sixth to Madison avenue,
 42d street, First to Eighth avenue,
 37th street, Sixth to Madison avenue, and Madison to Fourth avenue,
 32d street, Fourth to Lexington avenue,
 29th street, First avenue to Broadway,
 23d street, Third to Fourth avenue,
 22d street, Broadway to Fourth avenue,
 Stanton street, Bowery to Chrystie street, 2 days,
 Prince street, Elizabeth street to Bowery, 2 days,
 Broome street, Broadway to Centre street,
 Howard street, Mercer street to Broadway,
 Canal street, Greenwich street to Bowery,
 Leonard street, Hudson street to Broadway,
 Thomas street, Hudson to Church street,
 Reade street, Broadway to Centre street,
 Lexington avenue, 32d to 59th street,
 Madison avenue, 41st to 59th street,
 Eighth avenue, 13th to 59th street,
 Eleventh avenue, 23d to 24th street,
 Elizabeth street, Canal to Houston street,
 Vandam street, Greenwich to Macdougall street,
 Macdougall street, Vandam to Houston street,
 West Broadway, Chambers to Canal street,
 Greenwich street, Fulton to Vandam, 2 days,
 Pearl street and New Bowery, Fulton St. to Chatham Sq.,
 Catharine street, Cherry street to Bowery,
 William street, Beaver to Frankfort street,
 Beaver street, Broadway to Wall street,
 Broad street, Pearl to Wall street,
 Fifth avenue, 23d to 42d street,
 North William street, Park Row to Frankfort street,
 37th street, Third to Lexington avenue,
 Seventh avenue, 58th to 59th street,
 Fulton street, Broadway to William street,
 Centre street, Reade street to Park Row,
 William street, Frankfort street to Park Row,
 Fourth avenue, 14th to 15th street,

SHEET B.

List of Streets having Subways for Electric Light and Power Service:

Third avenue, Bowery and Park Row, from Harlem River to the Brooklyn Bridge,
125th street, from First avenue to Eighth avenue.

E. S. Broadway and Whitehall street, from 59th street to South Ferry (E. S. s. of
14th St., W. S. n. of 14th St.),

Sixth avenue, from 122d street to 125th street,

59th street, from Eighth avenue to First avenue,

58th street, from Sixth avenue to Madison avenue,

42d street, from Eighth avenue to First avenue,

37th street, from Sixth avenue to Madison avenue, and from Madison avenue to

Fourth avenue,

32d street, from Fourth avenue to Lexington avenue,

29th street, from Broadway to First avenue,

28th street, from Sixth avenue to Broadway,

27th street, from Sixth avenue to Madison avenue.

26th street, from Sixth avenue to Fifth avenue,

25th street, from Sixth avenue to Broadway,

24th street, from Sixth avenue to Broadway, and from Eleventh avenue to near
12th avenue,

23d street, from Eleventh avenue to Third avenue,

22d street, from Broadway to Fourth avenue,

21st street, from Fifth avenue to Broadway,

19th street, from Sixth avenue to Broadway,

14th street, from Eighth avenue to First avenue,

Houston street, from Hancock street to First avenue,

Stanton street, from Bowery to 150 ft. east of Chrystie St.,

Prince street, from Elizabeth street to Bowery,

Broome street, from Broadway to Centre street,

Howard street, from Mercer street to Broadway,

Canal street, from Greenwich street to Bowery,

Leonard street, from Hudson street to Broadway,

Thomas street, from Hudson street to Church street,

Reade street, from Broadway to Centre street,

Fulton street, from Washington street to Broadway,

Lexington avenue, from 32d street to 59th street,

Fourth avenue, from 14th street to 32d street.

Madison avenue, from 41st street to 59th street,

Sixth avenue, from 12th street to 59th street,

Seventh avenue, from 45th street to 58th street,

Eighth avenue, from 13th street to 59th street,

Eleventh avenue, from 23d street to 24th street,

Elizabeth street, from Canal street to Houston street,

Vandam street, from Greenwich street to Macdougall street,

Macdougall street, from Vandam street to Houston street,

West Broadway, from Chambers street to Canal street,

Washington street, from 100 ft. n. of Cortlandt street to Fulton street,

Greenwich street, from Fulton street to Vandam street,

Pearl street, from Fulton street to Oak street,

Catharine street, from Cherry street to Bowery,

William street, from Beaver street to Frankfort street,
 Beaver street, from Broadway to Wall street,
 New Bowery, from Oak street to Chatham Square,
 Broad street, from Pearl street to Wall street,
 South William street, from Broad street to Beaver street,
 Hanover street, from Exchange Place to Pearl street,
 Exchange Place, from William street to Hanover street,

And Mayor Grant moved the following resolution :

Resolved, That the Secretary be directed to send the usual ninety days' notice to the Electric Light and Power Companies owning or operating electrical conductors in the following streets and avenues in which subways for their service have recently been completed :

Park Row, from Chatham Square to Brooklyn Bridge,
 Whitehall street, from Beaver street to South Ferry,
 Sixth avenue, from 122d street to 125th street,
 58th street, from Sixth avenue to Madison avenue,
 42d street, from First avenue to Eighth avenue,
 37th street, from Sixth avenue to Madison avenue, and from Madison avenue to Fourth avenue,
 32d street, from Fourth avenue to Lexington avenue,
 29th street, from First avenue to Broadway,
 23d street, from Third avenue to Fourth avenue,
 22d street, from Broadway to Fourth avenue,
 Stanton street, from Bowery to Christie street,
 Prince street, from Elizabeth street to Bowery,
 Broome street, from Broadway to Centre street,
 Howard street, from Mercer street to Broadway,
 Canal street, from Greenwich street to Bowery,
 Leonard street, from Hudson street to Broadway,
 Thomas street, from Hudson street to Church street,
 Reade street, from Broadway to Centre street,
 Lexington avenue, from 32d street to 59th street,
 Madison avenue, from 41st street to 59th street,
 Eighth avenue, from 13th street to 59th street,
 Eleventh avenue, from 23d street to 24th street,
 Elizabeth street, from Canal street to Houston street,
 Vandam street, from Greenwich street to Macdougall street,
 Macdougall street, from Vandam street to Houston street,
 West Broadway, from Chambers street to Canal street,
 Greenwich street, from Fulton street to Vandam street,
 Pearl street and New Bowery, from Fulton street to Chatham Square,
 Catharine street, from Cherry street to Bowery,

William street, from Beaver street to Frankfort street,
Beaver street, from Broadway to Wall street,
Broad street, from Pearl to Wall street,
Fifth avenue, from 23d street to 42d street,
North William street, from Park Row to Frankfort street,
37th street, from Third avenue to Lexington avenue,
Seventh avenue, from 58th street to 59th street,
Fulton street, from Broadway to William street,
Centre street, from Reade street to Park Row,
William street, from Frankfort street to Park Row,
Fourth avenue, from 14th street to 15th street,
Unanimously adopted.

An application of the Elsworth L. Striker Estate, dated November 10, 1890, for permission to erect electric arc lamps, with the necessary wires and fixtures at certain mentioned places on Tenth avenue, West 52d and West 53d streets, connections to be made from private plants on the premises, was referred to Expert Wheeler for report.

Mayor Grant offered the following resolution:

Resolved, That the applications before the Board of the Western Union Telegraph Company for "time service" be granted.

Unanimously adopted.

Applications of the Gold and Stock Telegraph Company were referred back to Expert Wheeler for report.

Expert Wheeler: Here are some applications of the North New York Lighting Company.

Mayor Grant: What do you say about them?

Expert Wheeler: We have given the Company permission to restore its line; now it wants two more wires. I have examined into them very thoroughly, and I report in favor of granting them.

Commissioner Moss: I move:

Resolved, That applications of the North New York Lighting Company, as follows:

An application, dated November 29, 1890, to erect two poles on south side of 139th street, between Rider avenue and Morris avenue;

An application, dated December 1, 1890, to erect two poles on south side of Southern Boulevard, just east of Willis avenue, and string four wires on same to connect

improved line with Brommer's Union Park—these poles and lines being to replace those formerly running over private property from Willis avenue east to the Main building south of the Boulevard;

An application, dated December 4th, 1890, to string two wires on south side of Southern Boulevard, from west side of Third avenue to Willis avenue on existing poles; be granted.

Unanimously adopted.

Mayor Grant: Is there any further business before this Board?

Mr. Lauterbach: I have a matter to bring before it of some interest and importance. The suggestion that was made at the time of the application of the Standard Electrical Subway Company that the work of the Consolidated Telegraph and Electrical Subway Company be divided, so that the electric lighting business should be performed by one company and the low tension business as distinguished from the high tension should be done by another, met, as your Honor knows, with the approval and assent of the Consolidated Company. I regret that when the General Term had sanctioned the making of a contract entirely lawful and proper, but as placed such burdens on the contract as would in all respects make it as binding as the existing contract with the Consolidated Company, that the applicant Company for some reason did not seek to perfect the right which all were willing should be done, except perhaps some of the other companies which opposed what was suggested for the reason that it would place the control of the subways in the hands of a Company confessedly its competitor. There was some justice in that suggestion. With the exception of that suggestion I think there was no serious question raised as to the propriety of the division of the business, which would probably conduce to the general public benefit. The difficulty in the situation has always been that of endeavoring to raise funds for the purpose of building conduits. Very large sums of money have been necessary, having had to be raised entirely from the corporations interested in the matter—the Telephone people mainly, they being the largest stockholders, and the stock being held in their interest, and having had to advance money not only for purposes of their own but also for purposes of the electric lighting companies. The Consolidated Company has paid all reasonable demands and has kept pace with the tremendous demands for the exercise of its functions, and has done so satisfactorily. The only contention that exists between anybody in any respect is how much reward the laborer is worthy of, and that we hope will be adjudicated upon at an early day. There is nothing in the two businesses that is at all allied, and the view has been emphatically set forth by the Board that it would feed better satisfied if the business were done by a duality rather than a single company. Negotiations have been carried on for some time to effect the separation to which I refer. The most persistent efforts have been made in the direction of procuring a consolidation of the electric lighting interests among themselves, and a turning over of the property to the Electric Lighting Companies to manage as they deem

best, and to do their own business without guardianship or any other intervention. I think every Company will agree with me that that has been met in good faith and without the desire to intermeddle any further with their business; and whenever the day shall come that we shall be relieved from that duty I for one shall not feel very bad. It appeared that a proper consensus of opinion could not be had, and they all felt that it was better to remain under the gentle, kindly ruling administration of the Consolidated Company than to throw themselves even to their own guidance and direction, and certainly there was no desire to give any one company any preponderating influence in the administration of subway affairs. That was natural and proper; and I presume those are the difficulties which have made it impossible to carry out the suggestion as originally made that the high tension business should be divorced from the general systems, and that it should go to some other company to carry out the behests of the Board, leaving the Consolidated Company to do the remaining part of the business—the Edison, telephone and telegraph work. But so impressed have we been with the propriety of the general suggestion that we have followed in the direction indicated by the original proposition, and feeling that the difficulty of having the Telephone people show a proper interest in telegraph matters was growing greater, the suggestion was made subject to the action of the Board; and the initiative has been carried on to a condition where now I present to the Board to be submitted by you, if you see fit, to the Corporation Counsel papers which would have the result of allowing the Consolidated Company to remain the guardian and supervisor of the interests of the Electric Lighting Companies and turning over other interests to some other company. A company has been formed known as the Empire City Subway Company, composed, I think, of a majority of the stockholders of the present Company. That Company will assume the burden we now have in respect to the low tension business, leaving us better equipped to perform our business in respect to the high tension service. The fixed charges to which the Company is subjected and the large expenses of operation have demonstrated that it is a business which as soon as it reasonably be gotten rid, so far as the selfish interest of the Consolidated Company is concerned, will be for the better. I would be just as ready to advocate the final retirement of the Consolidated Company from the high tension business by which the Companies should secure control of their own interests. But if that is not to be the case, our duties and obligations to the Companies using high tension service will remain as they were, and they will no longer be involved with any difficulties arising in respect to the other class of business. Now, that is all very well for me to state in behalf of the Consolidated Company, and to urge the separation of telephone, telegraph and Edison companies from the high tension companies, but the public interests are of course paramount in this matter. Now, the public interests, it was decided by this Board, could be better subserved by having two companies to call upon rather than one, provided that the second company was of equal solvency, strength and ability to carry out the behests of the Board as the first. An investigation of the Empire City Subway Company will, I think, develop that fact fully. A copy of its articles of incorporation will be submitted, together with a bond as firm and complete as the bond of the Con-

solidated Company, and that new Company will at all events start in without any burden of expense, the burden appertaining to its own business, and it may be assumed that it will carry out whatever is suggested by the Board with equal zeal and loyalty to that manifested by the Consolidated Company, and with the same ability to perform what it undertakes. That bond is to be given. The contract is the same as the Standard Electrical Subway Control Company contract, except it refers to low tension instead of high tension, and also with the exception that whatever has been demarked by the General Term as an essential and prerequisite has been fully embodied in its terms. As to those matters—the question of solvency, the question of ability to perform, the question of propriety of the proposed contract, the question whether the rights of the municipality will be properly protected, the question of the nature of the bond, the question whether the contract does in all respects conform to the requirements of the General Term, are questions to be passed upon by the Board either by itself or the Corporation Counsel, and I will submit those papers and all others as are deemed to be necessary at this meeting for that purpose.

Mayor Grant: What will be the advantages to the city?

Mr. Lauterbach: Just the same advantages as at the time of the former application. The advantages would be this: that any conflict between the various companies would be obviated; that there would be two companies engaged in the work of building subways, doing an immense amount of work which is yet to be done, the burden of which on one company is serious, and that you can manifestly rely on receiving much more expeditious work with two companies carrying out orders than with one.

Mayor Grant: Is there likely to be any conflict?

Mr. Lauterbach: I cannot conceive of the least basis for such an outcome.

Commissioner Hess: The city would get an additional bond of the same amount?

Mr. Lauterbach: Yes. We are not relieved in any way from paying. You may still order us to do the low tension service; you may still order them to do high tension service if you require it. But in the event of the separation of the two interests, I can hardly conceive of any reasonable objection to the course adopted.

Mr. Einstein (of Counsel for Manhattan Electric Light Company and Harlem Lighting Company): So far as the Companies I represent are concerned we are unable now to say anything on the subject. Until we see the contract and the various papers to which Mr. Lauterbach refers we are unable to make any criticism upon the plan. So far as having another company, we can make no serious objection, and certainly do not, as I understand it, if the contract and all the papers are satisfactory.

Mr. Browne: I presume Mr. Lauterbach has no objection to letting the Electric Lighting Companies see the contract and papers?

Mayor Grant: The matter will be referred, before anything is done, to the Corporation Counsel, and I have no doubt you can see all the papers in his office, and I presume, if you cannot, Mr. Lauterbach will furnish you with copies. We were per-

fectly willing when the Standard Electrical Subway Company was an applicant here to grant to that Company a separate contract for the high tension business, or to any other company that would comply with the requirements and the decision of the General Term. No company seemed to be willing to take the responsibility. If it will facilitate the construction of subways and the putting of the wires underground, I do not know but that this Board will agree to it.

Commissioner Moss hereupon offered the following resolution :

Resolved, That the proposed agreement of the Empire City Subway Company, Limited, with the Board of Electrical Control, submitted to the Board by Mr. Lauterbach on behalf of that Company, be referred, together with the accompanying papers, to the Counsel to the Corporation for his opinion thereon, and whether it complies with the opinion of the General Term of the Supreme Court rendered in the case of the proposed contract with the Standard Electrical Subway Company.

Unanimously adopted.

Mayor Grant: It will be recorded on the minutes of the Board that a copy of the minutes be sent to the Commissioner of Public Works after each meeting.

Judge Kelly (of Counsel for the East River Electric Light Co.): I ask the Board to direct the Consolidated Telegraph and Electrical Subway Company to make house connections for the Companies when the Companies pay the cost of the same in advance. The Consolidated Company has taken the stand that they will make no house connections for any company until the rents are paid. These rentals are in litigation, and my request is that they be required to make house connections provided the Companies pay the cost of the connections in advance.

Mayor Grant: Probably that decision will be rendered very soon. Had we better interfere before the decision is made? We will take a short adjournment for the purpose of considering that matter. We will call a meeting for Monday at 1 o'clock.

The Board, on motion of Mayor Grant, referred an application of the Postal Telegraph Cable Company, dated November 8, 1890, to place one additional 8-pin cross-arm and six new wires on seventy poles, etc., in localities therein specified, to Expert Wheeler.

Engineer Kearny submitted to the Board the following report :

1266 BROADWAY, Dec. 4, 1890.

To the Honorable, the Board of Electrical Control :

GENTLEMEN :—I have to submit for your consideration and authorization applications for the construction of subways received since the last meeting :

Letter of Nov. 26th from the Consolidated Telegraph and Electrical Subway Company asking for the authorization of short sections of subways for the Edison Illuminating Company.

Letter of Nov. 28th from the Mount Morris Electric Light Co. asking for the authorization of various subsidiary connections.

Letter of Nov. 5th of Consolidated Telegraph and Electrical Subway Company, and map showing subsidiary connections and crossings.

Letter of Dec. 3d from the Consolidated Telegraph and Electrical Subway Company for subsidiary connections and crossings.

All of which I can recommend you to grant with the understanding that the work be begun when the Commissioner of Public Works will grant a permit for opening the street, and that he be not required to grant such permits on any newly paved streets.

Very respectfully,

HENRY S. KEARNY, Eng. of Board.

(Letter of Nov. 26th attached to the Report.)

NEW YORK, N. Y., November 26th, 1890.

To the Honorable, the Commissioners of the Board of Electrical Control, HON. HUGH J. GRANT, President, 1266 Broadway, New York, N. Y.:

GENTLEMEN:—We desire to submit herewith, for your approval and authorization, the following lines and connections of electrical subways, for construction during the present season of the special tubing of the Edison Electric Illuminating Company, for whose use the lines are desired, and for which we ask your favorable consideration and action, viz.:

1. On the north side of West 20th street, between Nos. 9 and 25, to connect with mains running east from 6th avenue to No. 25, and west from 5th avenue to No. 9.
2. Connection from tubing on west side of Broadway, between Rector street and Exchange Place, to premises No. 49 Broadway.
3. Connection from main at north west corner of South street and Burling Slip to Pier 20.
4. Connection from main at north side of Liberty street and No. 89 Liberty street to No. 95 Liberty street.
5. Extend main on east side of Union Square, between 14th street and No. 8 Union Square, to premises No. 10 Union Square.
6. Extend main on east side of 6th avenue, between 14th to 15th streets, to No. 174 6th avenue, between 12th and 13th streets.
7. Connection from main at northwest corner of Whitehall and Bridge streets, to premises No. 5 and 7 Bridge street.
8. Connection from main on north side of East 17th street to No. 11 East 17th street.

9. Connection from junction box at northwest corner of 36th street and Park avenue to No. 35 Park avenue.

10. Connection from spur extending from junction box at southeast corner of New Bowery and James street to premises No. 28 James street.

11. Connection from main on south side of Park Row, between Frankfort and North William streets, to City Hall Building.

12. Extend spur from main to be laid on east side of 5th avenue at intersection of 28th street, into 28th street on the south side, for an approximate distance of 200 feet, and set junction box at point of intersection.

Very truly yours,

E. L. RIDGWAY, V. President and G. M.

(Letter of Nov. 28th attached to Report.)

THE MOUNT MORRIS ELECTRIC LIGHT CO.,

CORNER VANDAM AND GREENWICH STS.,

NEW YORK, NOV. 28th, 1890.

COLONEL HENRY S. KEARNY, Engineer, Board of Electrical Control, 1266 Broadway, New York:

DEAR SIR:—We have made application to the Consolidated Telegraph and Electrical Subway Co., for the following subsidiary connections, and have been advised by them that they will build the required connections as soon as authorized by the Board of Electrical Control as required by the Department of Public Works before granting permit. We therefore hereby desire you to have granted the necessary authorization by your Honorable Board for building the following subsidiaries: From manhole S. E. cor. 9th street and Broadway into vault No. 766 Broadway (about 75 feet south); from H. H. N. E. cor Canal and Greene streets, up Greene to 8th street (on East side); from M. H. S. E. cor Broome street and Broadway to west side Wooster street (on north side Broome street); from M. H. N. W. cor 14th street and Union Square to No. 7 Union Square (about 40 feet north).

We also desire to hereby make application for subway on east side Wooster street from Canal to 8th street under the terms of our bond. Hoping that the above will be immediately authorized, we beg to remain,

Yours respectfully,

EDWARD MAY, President.

(Letter of Nov. 5th attached to Report.)

NEW YORK, November 5th, 1890.

The Honorable, the Board of Electrical Control, HON. HUGH J. GRANT, President, 1266 Broadway, New York, N. Y.:

GENTLEMEN:—We beg leave to submit herewith, for your authorization and approval, the following lines of electrical subways, for construction during the present

season, to consist of the special tubing of the Edison Electric Illuminating Company, for whose use the lines are desired:

1. 39th street, both sides, Madison to Park avenues.
2. Set junction box north side 23d street, intersection of 5th avenue.
3. Connection from junction box, to be located on north side 23d street, intersection 5th avenue, to Edison main, west side of 5th avenue, between 23d and 24th streets.
4. Connection from junction box, to be located on north side 23d street, intersection 5th avenue, and junction box at southwest corner of 23d street and 5th avenue, the connection crossing 23d street just west of crosswalk.
5. 35th street, north side, Lexington to 5th avenues.
6. 4th street, south side, Broadway to No. 20 West 4th street.
7. Mott street, east side, Canal to Hester streets.
8. Washington Square, north side, Macdougall street to University Place
9. 8th street, both sides, 5th avenue to Broadway.
10. 23d street, north side, Madison avenue to 150 feet east of 3d avenue.
11. Park avenue, east side, 35th to 37th streets.
12. Pearl street, east side, from junction box north side Fulton street to No. 255 Pearl street.
13. Connection from main west side Broadway at northwest corner of Liberty street to No. 87 Liberty street.
14. Set junction box south side Frankfort street, intersection of Gold street, and lay system on west side Gold street, Frankfort to Spruce streets,

Very truly yours,

E. L. RIDGWAY, Vice-President and G. M.

(Next follows tracing referred to in Report.)

(Letter of Dec. 3d attached to Report.)

NEW YORK, N. Y., December 3d, 1890.

To the Honorable, the Commissioners of the Board of Electrical Control, HON. HUGH J. GRANT, President, 1266 Broadway, New York, N. Y.:

GENTLEMEN:—We would respectfully submit herewith, for your approval and authorization, the following lines of electrical subways and crossings thereof, for construction during the present season, of the special tubing of the Edison Electric Illuminating Company, and for which we ask your favorable consideration:

Church street, west side, Duane to Leonard streets.

Franklin street, south side, Hudson to Greenwich streets.

Worth street, north side, Centre street to No. 129 Worth street.

Mercer street, east side, Canal street to north side Howard street.

42d street, north side, Centre of Madison avenue to west side 4th avenue.

20th street, north side, No. 9 to No. 27 West 20th street.

Crossing Hudson street, from northwest corner of Duane to southeast corner of Thomas street.

Crossing Hudson street, from northeast corner of Leonard street to southwest corner of Franklin street.

Crossing 42d street, from north side of junction box at southwest corner of 4th avenue.

Crossing 5th avenue from northwest to northeast corner of 8th street.

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We desire to cancel application of September 17th, 1890, for authorization of east side 6th avenue, 40th to 53d streets.

Very truly yours,

THEO. M. VAIL, President.

(Memorandum attached to report of Engineer Kearny.)

For the Manhattan Electric Light Company:

E. Strauss, 1706 3d avenue, Nov. 26.

J. F. McMahon, 472 Sixth avenue, Nov. 14.

From M. H. northwest corner 6th avenue to No. 423 6th avenue, Nov. 1.

The Board considered the report of Engineer Kearny, and, on motion of Mayor Grant, adopted the following resolution:

Resolved, That the application submitted by Engineer Kearny which are for subsidiary house connections be granted, and the others laid over.

Unanimously adopted.

The Board hereupon, on motion of Mayor Grant, adjourned until Monday, December 8th, 1890, at 1 o'clock P. M.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Monday, December 8th, 1890, at 4 o'clock P. M.

Present: Mayor Hugh J. Grant, President, Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Commissioner Moss laid before the Board the following communication from the Corporation Counsel:

NEW YORK, December 8th, 1890.

HONORABLE THEODORE MOSS, Secretary, Board of Electrical Control:

SIR:—I herewith return to you the papers transmitted to me with your communication of the 4th instant.

I have heretofore advised your Board that it has the power to make other and further contracts for the construction of subways, and the right of your Board to make such contracts has been judicially determined in the Special and General Terms of the Supreme Court.

The proposed agreement between the Empire City Subway and your Board complies with the requirements of the General Term in the case of Armstrong vs. Grant.

Yours respectfully,

WM. H. CLARK, Counsel to the Corporation.

Mayor Grant: I have just stated to Mr. Clark that the question was asked at the last meeting, and I presumed it was included in the resolution asking for his opinion, as to what position this new contract would leave the old one, and I understand Mr. Clark to say now, that it leaves it in the same position.

Mr. Clark: I did not so understand the resolution; but if that question has been incorporated in it, I would have said that it leaves the old Company in the same position as to the Board as it is at the present time. I would suggest that the bond of the old Company be renewed lest there might be some question about the release of the sureties upon it.

Mr. Lauterbach (of Counsel for the Consolidated Tel. and Electrical Subway Co.): It has been arranged that a new bond be given by the Empire City Subway Company.

Mr. Clark: I mean the Consolidated Telegraph and Electrical Subway Company—the old Company—lest there may be any question of the release of the sureties.

Mr. Lauterbach: That has been arranged for. The Surety Company will give a new bond. We propose to give the same sureties as before.

Mr. Clark: I will approve the bond as to form, but as to sufficiency of the sureties that is a matter the Board ought to determine.

The United Electric Light and Power Company, United States Illuminating Company, Brush Electric Illuminating Company, represented by Mr. Cravath and Mr. Browne, Manhattan Electric Light Company and Harlem Lighting Company, represented by Mr. Einstein and Mr. Leslie, East River Electric Light Company, represented by Judge Kelly, made application to the Board for an adjournment, and a postponement of further action in respect to the proposed agreement until the Electric Lighting Companies could examine the agreement and papers related thereto and confer with one another and determine whether they desired to oppose its execution; and

The Board, after hearing argument from these gentlemen in support of their application, on motion of Mayor Grant, laid the matter over until Wednesday next, December 10th, at 1 o'clock P. M.

The Board next considered an application of the Mount Morris Electric Light Company for house connections, and, on motion of Mayor Grant, adopted the following resolution:

Resolved, That the Consolidated Telegraph and Electrical Subway Company be authorized, empowered and directed to construct subways for the Mount Morris Electric Light Company, as follows:

A house connection on Greene street, from manhole at corner of Bleecker street to No. 209 Greene street; and

A house connection on Broome street from Broadway to Wooster street.

Unanimously adopted.

An adjournment was hereupon taken to Wednesday next, December 10th, at 1 o'clock.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Wednesday, December 10th, 1890, at 1 o'clock P. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Mayor Grant: I invite gentlemen here, who wish to be heard on this subject which the Board has met to consider to-day, to speak.

Mr. Moore, a representative of the East River Electric Light Company and the North New York Lighting Company, asked for a short delay in the absence of Judge Kelly, who was momentarily expected to be present, and stated in response to questions put by Mayor Grant:

"For myself I have objection. I object to the Edison Electric Illuminating Company being treated differently from the other Electric Lighting Companies. It has the same class of business precisely. They are serving the public in the same way. Now, if they go in this Empire City Subway Company, they will have a decided advantage over us. We don't think they ought to be entitled to that advantage. There are technical objections which I suppose Judge Kelly will advance."

Gentleman (representing U. S. Illuminating Co., Brush Electric Ill. Co. and United Electric Light and Power Co.): Mr. Cravath, who represents the United Light and Power Company, the Brush Company and the United States Company, is out of town. I would like to state that we do not wish this contract in its present form to go through to-day. We really have not had time to make a thorough examination of it, having been engaged in other things; and Mr. Cravath has been called out of town on urgent business, and I cannot get him here until to-morrow at least.

Mayor Grant: That is not a sincere objection, because Mr. Cravath knew that the postponement until to-day was had at his and Mr. Einstein's request only.

Gentleman: We do sincerely object to the Edison Illuminating Company receiving exclusive benefits and privileges, as we believe it will receive under this present contract.

Mayor Grant: The Secretary will read the resolution. Did you see this resolution, (exhibiting paper) Mr. Corporation Counsel?

Mr. Clark: I had a resolution submitted to me; whether that is an exact copy I do not know.

Mayor Grant: Is that it?

Mr. Lauterbach: An exact copy I think, with a suggestion made by Mr. Clark.

Mr. Clark: Probably. The Secretary will read it, everybody will then hear it.

The following is the resolution referred to:

Whereas, In view of the necessity of rapid construction of subway accommodations, this Board heretofore by resolution determined that it was expedient that a division be made of the work to be performed, and that a further contract or contracts be made for the construction of subways for electric light and power conductors, and as practically the same state of facts exists, and the same reasons for division of the work to be performed as when said resolution was adopted; and

Whereas, No person or corporation has offered or offers to make such further contract for the construction of subways for electric light and power conductors; and

Whereas, The same division of the work to be performed can be made, and the same objects can be attained by the making of a further contract with some person or corporation for the construction, maintenance and operation of subways for the use of telephone and telegraph conductors, and the conductors of the Edison Electric Illuminating Company of New York; and

Whereas, Experience has demonstrated to the Board of Electrical Control that a division of the work of constructing subways, so that the same may be performed by two companies instead of one as at present, will more effectually secure the objects contemplated by the creation of the Board of Electrical Control, and that a separation of the management of the subways used for low tension service from those used for high tension service will tend to produce greater efficiency in the general management and will tend to improve the character and efficiency of both kinds of service, the high as well as the low tension, and better secure the interests of all the electrical companies and of the public; and

Whereas, The Consolidated Telegraph and Electrical Subway Company is willing, if in the opinion of this Board, such course shall be desirable, that the duty to build and the right to build such subways and ducts as may be hereafter ordered for telephone

and telegraph purposes, and for the use of the Edison Electric Illuminating Company of New York shall devolve upon the Empire City Subway Company (Limited), which shall also acquire the ownership of and be entrusted with the management, supervision and control of such of the subways already constructed, as are used or intended to be used for low tension service, and that the work hereafter to be performed by the Consolidated Telegraph and Electrical Subway Company shall be the construction of conduits to be used for electric light and power conductors other than the conductors of the Edison Electric Illuminating Company of New York, and that its ownership, supervision, management and superintendence shall be hereafter limited to ducts for such electric light and power conductors; and

Whereas, The Consolidated Telegraph and Electrical Subway Company is willing to sell and transfer to the said Empire City Subway Company (Limited), on terms which have been agreed upon, all the subways, conduits and ducts constructed for the use of the Edison Electric Illuminating Company of New York, and for the use of telephone and telegraph companies, being all the ducts heretofore constructed and in process of construction for low tension service, provided that said Consolidated Telegraph and Electrical Subway Company shall, by an agreement between the Board of Electrical Control and the said Consolidated Telegraph and Electrical Subway Company be relieved from its duties and obligations under existing contracts with respect to the subways and other properties so sold and transferred, and that the rights of the said Consolidated Telegraph and Electrical Subway Company to build subways, conduits and ducts for telephone and telegraph conductors and for conductors to be used by the Edison Electric Illuminating Company of New York, or its assigns, under said agreement, shall be surrendered and the duty of building, maintaining, operating and leasing such subways, ducts and conduits as may be ordered to be built for telephone and telegraph conductors and for conductors of the Edison Electric Illuminating Company of New York, or its assigns, shall be assumed by said Empire City Subway Company, by an agreement with this Board; and

Whereas, The Empire City Subway Company (Limited), offers to enter into a contract with this Board for the construction, maintenance and operation of the subways for telephone and telegraph purposes and for the use of the Edison Electric Illuminating Company of New York, and also for the maintenance and operation of the subways already constructed or in process of construction for the same purposes; and

Whereas, For the reasons above stated, and for other reasons the existing contract with the Consolidated Telegraph and Electrical Subway Company has become ineffectual for the accomplishment of the just purposes of the Act of the Legislature of the State of New York, approving said contract.

Therefore, Resolved, That, in view of the facts hereinbefore recited, and in order to secure greater uniformity in the management and conduct of the business to be carried on in the subways by separating the operation, management and control of the high tension service from the low tension service, and in order more fully and ef-

fectually to accomplish the just purposes of the existing contracts, and of the said Act of the Legislature of the State of New York, approving the same, it is, in the opinion of this Board, deemed expedient, reasonable and proper that such separation as is proposed be made; that the contracts with the said Consolidated Telegraph and Electrical Subway Company and with the Empire City Subway Company (Limited), respectively, of which contracts copies are hereto annexed, be made by this Board, and that a sale and transfer of subways and other properties as proposed and upon the conditions above mentioned be approved by this Board; and

Whereas, The contracts, of which copies are hereto appended, intended to carry the purposes of these preambles and resolutions into effect, have been prepared and have been approved by the Mayor and the Corporation Counsel of the City of New York.

Resolved, That said contracts be and the same are hereby approved, and that this Board proceed forthwith to execute and deliver the same.

Resolved, That the Empire City Subway Company (Limited) be and it is hereby ordered, to build such of the subways for telegraph and telephone purposes and for the use of the Edison Electric Illuminating Company of New York, as have been heretofore ordered by this Board to be built, so far as same have not yet been completed.

Resolved, That the Consolidated Telegraph and Electrical Subway Company be required to replace the bond heretofore given by it to this Board, by a new bond, with surety in the like penal sum, viz.: \$250,000, and with the same conditions as in the bond replaced, except so far as changes may be proper to conform to the changes in the obligations and liabilities of said Company in consequence of the modifications of its contract with this Board, authorized by the foregoing resolution, and that upon the giving of such new bond, in form approved by the Corporation Counsel, the bond heretofore given be cancelled and surrendered.

The Board listened to the reading of the preambles and resolutions, and, in answer to questions, suggestions and objections principally by Mayor Grant, heard explanations and expositions of their force and effect from Mr. Clark and Mr. Lauterbach, and, at the suggestion of Mayor Grant, altered the preamble preceding the second resolution so as to read as follows:

"Whereas, the contracts, of which copies are hereto appended, intended to carry the purposes of these preambles and resolutions into effect, have been prepared and have been approved by the Corporation Counsel of the City of New York, and are hereunto annexed for the purposes of identification."

Pending their reading and consideration, an order to show cause, in a suit in the Superior Court between Edward Henry, plaintiff, and Hugh J. Grant and others, defendants, signed by Judge Dugro, returnable the 11th instant, at 10 o'clock in the forenoon, enjoining and restraining the making of a contract with the Empire City Subway Company (Limited), or any contract for the construction, maintenance and operation of

subways for electrical conductors in the streets, avenues and highways of the City of New York, was served upon Mayor Grant.

The injunction order was read.

Mayor Grant: Mr. Einstein, there is nothing in that order that prevents us from fixing the rentals. I think the proper thing to do is to fix them.

Mr. Einstein (of counsel for Manhattan and Harlem Electric Light Companies): As matter of course that is getting off on another subject.

Mayor Grant: I understand that. It is before the court, where you will probably leave the whole subject. As we evidently cannot do anything without your getting an injunction, I think this Board ought to fix the rents so that you can bring it up before the court at once.

Mr. Einstein: So far as the rental question is concerned, that is now before the Supreme Court, and it is as directly before that court as it can possibly be brought there. It would be useless to have an action pending in the Supreme Court and an action pending in the Superior Court to determine the identical question. We cannot prevent this Board from taking such action either as to rental or any other subject—

Mayor Grant: I understand that—

Mr. Einstein: But it strikes me as being improper for this Board to take action in relation to a matter which is now really in the hands of a judge of the Supreme Court for his decision. That is one of the matters that was discussed before him. It is the direct issue to be decided in that action in the Supreme Court.

Mayor Grant: If you want to review our decision, let us fix it. I think you will want to review it.

Mr. Einstein: This important matter is before the Board.

Mayor Grant: That is off.

Mr. Einstein: This is a taxpayer's suit. We represent certain electric light companies, and we have objections to this contract independently of whatever any taxpayer may have to it. Whatever the taxpayer's rights may be, these electric light companies have some rights as well, and they desire to assert those rights. They will assert them here, or, if they cannot get the opportunity, somewhere else. I think you will act hastily in fixing the rental now.

Mayor Grant: I am satisfied of this: that the sooner we get through with all this litigation the quicker we will get something done. Let us fix the rentals here; you will take it to the court and review it anyhow, at whatever price we fix the rentals.

Mr. Einstein: The case of the Manhattan Electric Light Company against the Subway Company has been put upon the calendar by us in the Supreme Court, and notice of trial has been served; we have offered to go on trial with the other side so

as this matter can be determined without any delay; they have been unwilling to go on trial, and we are now going to force them to trial.

Mayor Grant: Suppose you bring this in, too.

Mr. Lauterbach: It is an important issue.

Mr. Einstein: How can we inject something in the trial of that action taking place subsequently?

Mr. Lauterbach: If you desire to serve a supplemental complaint I will admit service of it.

Mr. Einstein: I don't understand why this should be done; this matter is before the court.

Mayor Grant: We are simply doing things for the courts to review evidently; let us get it there at once.

Mr. Einstein: There seems to be fault found with the Companies because they try to assert their rights. They have a large amount of interest involved. They have a right to come before this Board or any other tribunal and assert their rights. When they do that they ought not to be blamed.

Mayor Grant: I am not blaming you at all.

Mr. Einstein: They have a large interest involved, and when they come here they ought to be heard because of their right to be heard, and because of the interest involved.

Mayor Grant: That is what I am trying to do. You will review this anyhow; I want to get this there before next spring.

Mr. Einstein: You cannot wish it more than I. It is a consummation most all of us devoutly wish would be brought about, and I am anxious to get rid of litigation as soon as possible; but why take up the question of rental when it is entirely independent of the question before us? It is something I am unable to understand.

Mr. Lauterbach: I think the suggestion made is a proper suggestion. If, as has been said, these questions are to be brought up for adjudication, it is well to have the whole matter adjudicated. An adjudication of the court at General Term referring the matter back to the Board to decide upon what the amount of rental should be, would bring this matter up for review before the same court after the adjudication had been made by the Board. And I think the Corporation Counsel will agree with me that it is much more orderly, much more conclusive, much more decisive of the question, if, when this case is brought on for trial, the finding of the Board shall be part of the evidence, and a part of the proceedings to be reviewed.

Mr. Clark: I think that is so.

Mr. Einstein: So far as the question of supplemental complaint is concerned, I say, we will not serve a supplemental complaint no matter what the action of the Board may be.

Mayor Grant: If you can go piece-meal with everything connected with this Board to the courts, the consequence will be that we will never get anything done.

Mr. Einstein: We are as anxious to assist you as possible. There is no disposition on the part of any Electric Light Company to obstruct the action of this Board in any respect.

Mayor Grant: I am not complaining. I want to get this rent fixed by the court; I would rather that it would relieve me of the responsibility. And as the court can review my decision, and you will evidently bring it before the court for their review, I say it don't make any difference at what we fix the rent as long as we get the decision before it. Then we will get these legal complications out of the way, and we will be able to build subways.

Mr. Einstein: Don't you think the matter ought to be referred to the Corporation Counsel for the purpose of determining whether action brings that matter up in the Supreme Court?

Mr. Clark: I have no desire to have it referred to me. The Board ought to fix the rentals; and if it has fixed them at an exorbitant sum or a sum insufficient, its decision can be reviewed by either side in court.

Commissioner Hess: I agree with Mayor Grant that we ought to have this question of rental left to the courts to determine. I suppose the resolution I am going to offer, if passed, will bring about such a result.

I move:

Resolved, That the rentals charged to the Companies be at the rate of \$850 per mile per duct per annum, for the present, subject to a revision of this Board.

(Withdrawn—see substitute.)

Mr. Lauterbach: I shall file my objection to that, if that be the amount fixed. I know of no evidence that has been adduced that justifies the reduction of the rental below the price we have fixed and that has generally been acceded to.

Mr. Einstein: Do I understand Mr. Lauterbach to say that the amount of rental is unsatisfactory?

Mr. Lauterbach: If the amount is \$850 for three inch ducts it is unsatisfactory.

Commissioner Moss: If it is going to be reviewed make it \$1,000.

Mayor Grant (after some informal discussion and figuring): As I understand the motion of Commissioner Hess it is this: For three inch ducts the Board fixes the price at \$900; for 2½ inch ducts at \$800; this is to be fixed for the present, and the Board having the power to review its own decision at any time, so that you may have an opportunity to bring it before the court.

Mr. Einstein: Since the Electric Light Companies are very largely interested in the amount they have got to pay, is it a pertinent question to ask the Board upon what basis it arrives at these figures?

Mayor Grant: We are making it upon the basis that it is evidently the intention of the Electric Light Companies to review every action of this Board, and that we make it upon the basis of what information has been furnished to us by the Engineer of the Board of Electrical Control and such other information as we have been able to procure; and we make the rate provisional in the resolution, so that if there is any excessive price in fixing the rent this Board can change it or you have an opportunity of reviewing it before the court.

Mr. Einstein: Then on the part of our Companies we protest against it, and we hope——

Mayor Grant: You are both protesting, and it is good——

Mr. Einstein: So the Board has not acted satisfactorily to either party.

Mayor Grant: It has acted satisfactorily to itself.

Mr. Einstein: I know it has acted what it thinks is right; that I am sure of.

Judge Kelly: You do yourselves injustice and the Board. The Companies would not desire—at least our Company would not desire—to review the action of the Board unless they felt the Board had erred in judgment. Now, as regards fixing these rates of rental, we also enter protest to the rate; we would like an opportunity of arguing the matter before the Board. There are a great many facts and figures which would make it plain that a rental at three or four hundred dollars is just and proper. It does not require an expert or a skilled person to pass on these questions.

Mayor Grant: I think you were not here when we commenced the discussion. Immediately on the injunction being served, I said that the business of this Board had been transferred to the courts, there was one thing left for the Board, and that was the fixing of rentals. While you probably would be perfectly willing yourself to take the decision of the Board for a Company, it is evident that some taxpayer would say that the rates are too high, or something of that nature; but it would be brought before the court, and as most of it belongs before the court and is going to be submitted to the various judges, we thought the best thing we could do was to take it all to court and let it all be decided at once, when the whole facts would be before some judge or judges.

Judge Kelly: This is not a matter that does appeal to a legal mind; it rather appeals to the judgment of fair-minded business men. The question of rentals will depend upon the cost of construction. Now, I am free to say that I have papers prepared—and I prepared them for this matter when it should come up before the Board. I did know the matter would come up, and I could have been ready for it had I had a few hours' notice. This is not a matter for the courts of law.

Mayor Grant: In place of getting an injunction let us get one thing before the courts without an injunction.

Gentlemen: If your Honor will hear me, I merely wish to protest against this action, on behalf of the United States Illuminating Company, the Brush Electric Illuminating Company and the United Electric Light and Power Company, on the ground that there is no evidence before the Board to base its action on, that there is no adequate evidence of the cost of these subways before the Board, and that this action is from its very nature arbitrary and without any adequate justification, and also that it is summary, and it is without any hearing to the Companies, and without any full investigation of the facts on which the judgment of the Board is based. And for that reason we would earnestly protest against the action, and would like to have it appear.

Commissioner Hess: What knowledge have you that we have not investigated this matter?

Gentleman: Only from knowledge of your meetings of the Board.

Commissioner Hess: It was referred to your Engineer.

Mr. Einstein: Did you use that as the basis?

Commissioner Hess: Partly.

Mr. Einstein: I think the Electric Light Companies are entitled to the same knowledge. If the Commissioner has any information on it we would like to know it.

Commissioner Hess. I don't say I had any. I presume I have a right to use my own judgment.

Mr. Lauterbach: The Consolidated Company has some vital interest in this matter. More than two years ago, at the request of the Board of Electrical Control, a schedule of rates was fixed by the Consolidated Company based upon the experience of the Chicago enterprise.

He continued his remarks at some length, reciting what had taken place in respect to the question of rentals, and arguing against their reduction.

Mr. Forster, on behalf of the Mount Morris Electric Light Company, made a protest to the same purport and effect as the one made on behalf of the United States, the Brush and the United Electric Light and Power Company.

Mayor Grant: You understand this is fixed for the purpose of bringing it before the court to review it.

Mr. Forster: We simply do this to preserve our rights.

Mr. Einstein: I understood that is understood by the Subway Company as well.

Commissioner Hess withdrew his resolution, offering the following substitute:

Resolved, That hereafter the rentals to be charged for trunk line ducts be fixed as follows:

For 3-inch ducts, \$900;

For 2½-inch ducts, \$800;

For 2-inch ducts, \$700

per mile per annum, and that the action of the Board be subject to its own reconsideration at any time, and not to foreclose any other action on the question.

Unanimously adopted.

Mr. Einstein: Does the Board intend that this acts as to rents that have been accruing or as to future rents? I want to know whether it is the future, past or present.

Mayor Grant: We cannot pass a resolution that will act nunc pro tunc.

Mr. Einstein: You mean to say it is to be future?

Mayor Grant: I suppose so.

Judge Kelly: I would like an opportunity of saying to the Board, in Chicago the rental was \$500 per mile per duct per annum.

Mayor Grant: I always like to listen to you, but make that statement to the court.

Judge Kelly: I don't want this Board to take a wrong step. We will show that these ducts cost \$300 this Company is exacting \$900 for.

The resolution was hereupon adopted by a unanimous vote.

Judge Kelly, on behalf of the East River Electric Light Company, requested the Board to require the Consolidated Telegraph and Electrical Subway Company to build house connections for it, provided the expense of the construction was paid in advance, stating that the Consolidated Company had refused to provide them because of non-payment of rentals which are still in dispute, and instancing a case where his Company had paid rental for a duct and was unable to use it for want of the connection.

Mr. Browne, on behalf of the United Electric Light and Power Company, the United States Illuminating Company and the Brush Electric Illuminating Company, joined Judge Kelly in his request, making a similar statement, and citing a like instance.

Mayor Grant: I don't care to order any more work and necessitate the Commissioner of Public Works declining to give a permit therefor; and while your position may be correct, I don't think it is fair to put the Commissioner always in the position of having to refuse permits which we might have declined to give originally.

Mr. Browne: Then we will not have the occupancy of two ducts from now until spring?

Mayor Grant: They cannot charge you for a duct you cannot use.

Mr. Browne: I am glad to hear that from your Honor.

Adjourned sine die.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Monday, December 15th, 1890, at 10.30 o'clock A. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The minutes of the last meeting were read and approved.

Judge Kelly (of Counsel for the East River Electric Light Company): I withdraw that application of the East River Electric Light Company entered on the minutes of the last meeting, in reference to subsidiary connections.

Mayor Grant: The Corporation Counsel advises this Board that, in order to bring the injunction case properly before the court, it is wise and requisite that preambles and resolutions such as the Secretary has in his hands be adopted and presented to the court this morning.

Commissioner Moss: I move their adoption.

The preambles and resolutions, as follows, were hereupon read and adopted:

Whereas, in view of the necessity of rapid construction of subway accommodations, this Board heretofore by resolution dated the 17th day of February, 1890, determined that it was expedient that a division be made of the work to be performed, and that a further contract or contracts be made for the construction of subways for electric light and power conductors, and as practically the same state of facts exist and the same reasons for division of work to be performed as when said resolution was adopted; and,

Whereas, no person or corporation has offered or offers to make such further contract for the construction of subways for electric light and power conductors; and,

Whereas, the same division of the work to be performed can be made, and the same objects can be attained by the making of a further contract with some person or corporation for the construction, maintenance and operation of subways for the use of telephone and telegraph conductors and the conductors of the Edison Electric Illuminating Company of New York;

Therefore, Resolved, That in view of the facts hereinbefore recited, and those facts recited in said resolutions of the 17th day of February, 1890, and in order to secure greater uniformity in the management and conduct of the business to be carried on in the subways by separating, so far as practicable, the operation, management and control of the high tension service from the low tension service, and in order more fully and effectually to accomplish the just purposes of the Act of the Legislature of the State of New York approving the existing contract with the Consolidated Telegraph

and Electrical Subway Company, it is by this Board hereby decided and determined that the said existing contract with the Consolidated Telegraph and Electrical Subway Company has become ineffectual for the accomplishment of the just purposes of the said Act of the Legislature of the State of New York; that the proposed contracts with the said Consolidated Telegraph and Electrical Subway Company and with the Empire City Subway Company (Limited), respectively, which have been approved by the Corporation Counsel of the City of New York, and of which copies are hereto annexed, be made, executed and delivered by this Board as soon as it may not be enjoined from so doing.

Resolved, That the Consolidated Telegraph and Electrical Subway Company be required to replace the bond heretofore given by it to this Board, by a new bond, with surety in the like penal sum, viz.: \$250,000, and with the same condition as in the bond replaced except so far as changes may be proper to conform to the changes, obligations and liabilities of said Company in consequence of the modifications of its contract with this Board, authorized by the foregoing resolution.

Unanimously adopted.

Mayor Grant (at conclusion of their reading and before adoption): Judge Kelly, you heard these preambles and resolutions?

Judge Kelly: Yes.

Mayor Grant: Did you see any objection to them?

Judge Kelly: No.

Adjourned sine die.

Minutes of a meeting of the Board of Electrical Control, held at the office of the Mayor, in the City of New York, on Friday, December 26th, 1890, at 1 o'clock P. M.

Present: Mayor Hugh J. Grant, President; Commissioners Jacob Hess and Theodore Moss.

The reading of the minutes of the last meeting was dispensed with.

The Board, on motion of Mayor Grant, directed the Secretary to issue permits to the Metropolitan Telephone and Telegraph Company upon its applications before the Board, approved by the Expert, for overhead individual telephone connections.

The following communications from the Consolidated Telegraph and Electrical Subway Company were referred to Engineer Kearny to report upon:

NEW YORK, December 8th, 1890.

To the Honorable the Commissioners of the Board of Electrical Control, HON. HUGH J. GRANT, President, 1266 Broadway, New York, N. Y.:

GENTLEMEN:—We submit herewith for your approval and authorization the following connections of electrical subways, to be constructed of the special tubing of the Edison Electric Illuminating Company, for whose use they are desired, and for which we ask your favorable consideration and action:

Connect premises No. 11 East 17th street with Edison main on east side of Fifth avenue, and set junction box at point of intersection.

Connect premises No. 55 Eighth avenue with Edison main on west side of Eighth avenue at intersection of 13th street.

Connect premises No. 41 Dey street with Edison main on south side of Dey street, between Broadway and Church street.

Connect premises No. 28 Elm street with spur extending into east side of Elm street, from Edison main on Duane street.

Very truly yours,

E. L. RIDGWAY, Vice-President.

NEW YORK, December 11th, 1890.

To the Honorable the Commissioners of the Board of Electrical Control, HON. HUGH J. GRANT, President, 1266 Broadway, New York, N. Y.:

GENTLEMEN:—We desire to submit herewith for your approval and authorization the following line for the ventilation of the telephone and telegraph subways north of 79th street, the construction to consist of wrought iron pipe of large diameter, for which we desire your favorable consideration and action:

From the manhole at the northwest corner of Third avenue and 111th street, on the north side of 111th street, to a point opposite No. 207, connecting with a blower plant to be established in said premises.

We also desire authorization to build a connection for the Edison Electric Illuminating Company from the Edison main on the east side of Fourth avenue to No. 111 East 23d street, and set junction box at point of intersection; construction to consist of the special tubing of the Edison Company.

Very truly yours,

E. L. RIDGWAY, Vice-President.

NEW YORK, December 24th, 1890.

To the Honorable the Commissioners of the Board of Electrical Control, HON. HUGH J. GRANT, President, 1266 Broadway, New York, N. Y.:

GENTLEMEN:—We would respectfully submit herewith for your approval and authorization the following electrical subway connection, for the Edison Electric Illuminating Company, to be constructed during the present season of the special tubing of that Company, and for which we ask your favorable consideration and action:

Connect premises Nos. 22-24 West 59th street with Edison main between Sixth avenue and premises No. 30 on the south side of West 59th street.

Very truly yours,

E. L. RIDGWAY, Vice-President & G. M.

An application of the North New York Lighting Company, dated December 12th, 1890, was next considered.

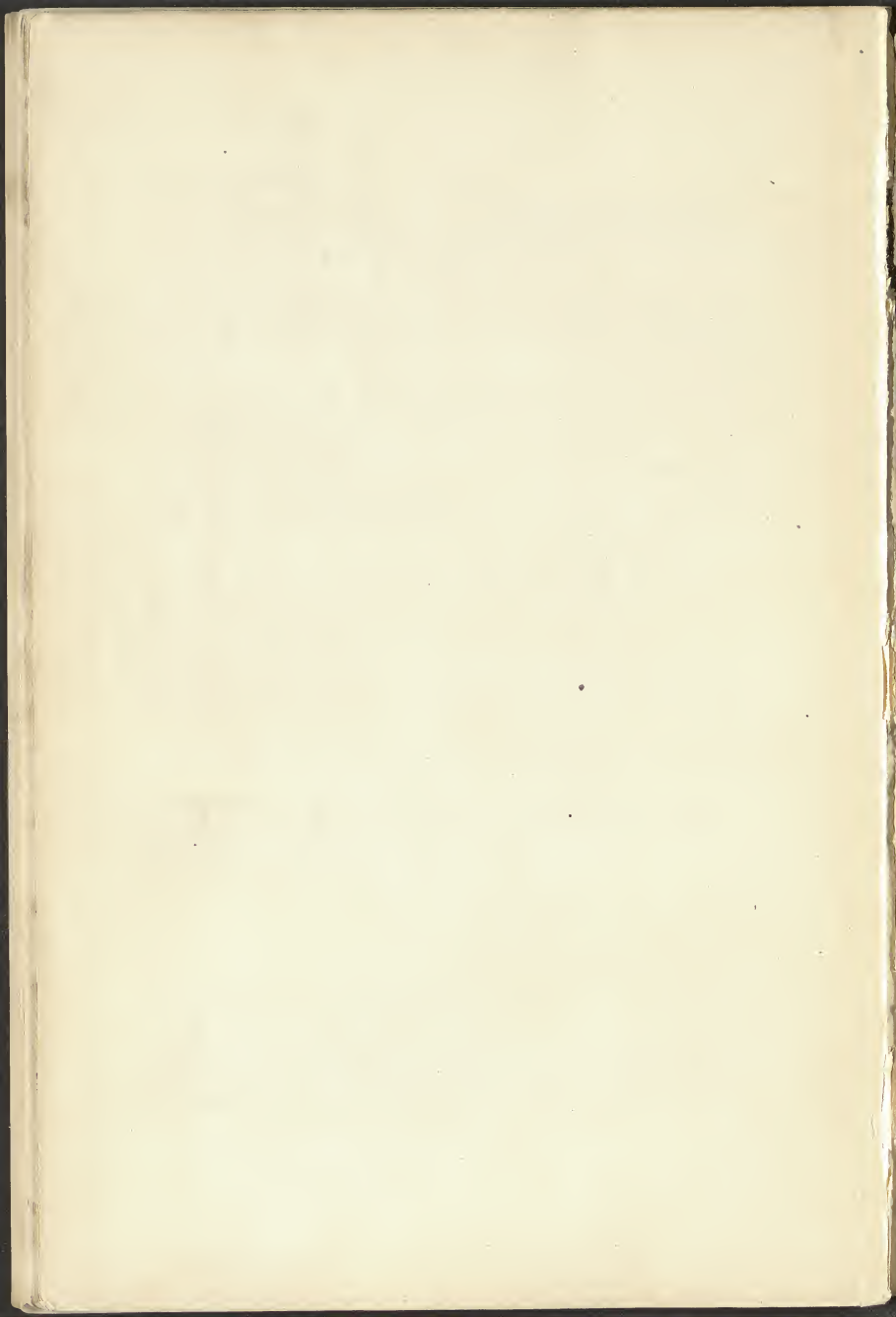
And, on motion of Mayor Grant, after hearing Expert Wheeler thereon,

The Board granted all that portion of the application favorably reported upon, as follows:

"To string 6 wires on existing poles on 139th street, between Morris and Rider avenues.

"To erect 6 poles on 134th street, between Third avenue and Alexander avenue, and to string 4 wires on the same."

An adjournment was thereupon taken to Friday, January 2d, 1891, at 1 o'clock P. M.





Minutes of the Board
of Commissioners of
Electrical Subways

(July 20, 1885, to June 29, 1887) and

Board of Electrical Control

(July 5, 1887, to December 26, 1890)

in *The City of New York*

V O L U M E O N E